



Deliverable 2.3.4

EMPOWER Handbook

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1 Summary

This document includes the user manuals for the EMPOWER disease management component (target group physicians) and for the EMPOWER patient portal (target group patients) and describes all EMPOWER modules in detail. In this way, this document serves as a handbook for both the physicians and the diabetes patients. Additionally to this document a screencast is available demonstrating the EMPOWER prototype by a use case.

2 EMPOWER in a Nutshell

Patient Empowerment involves patients to a greater extent in their own healthcare process and disease management becomes an integrated part of their daily lives. The capability of self-management opens to them the possibility for patients not only to contribute to their own healthcare but also to be more in control of their disease. EMPOWER develops a modular and standard-based Patient Empowerment Framework which facilitates the self-management of diabetes patients based on PHRs and on context-aware, personalised services. EMPOWER focuses the research and development efforts on a patient-centric perspective that also involves healthcare professionals. EMPOWER provides knowledge-based Self-Management Pathways for diabetes patients. This includes

- (1) Services for the specification and execution of actions to change behaviour according to diabetes-specific health care needs. Patients can develop personalised action plans which include recommendations from the treating physicians and patients' preferences

Services for monitoring of vital, physical, mental parameters as well as physical and lifestyle activities based on health standards.



EMPOWER semantically integrates multiple information sources (EHR/PHR, diabetes guidelines, patterns of daily living) for a shared knowledge model. The Self-Management Pathways facilitate the specification of recommendations that allow specifying individual goals for the patient. Based on these goals, relevant information and their preferences patients can specify their individual diabetes-specific actions. The Self-Management Pathways are an iterative process where executed actions and reported patterns of daily life can be evaluated. Recommendations, goals and actions can be updated iteratively according to current needs and preferences. Finally, the services in EMPOWER will embrace semantic interoperability based on health standards such as HL7¹ and IHE² profiles.

EMPOWER addresses long-term goals and short-term activities in order to facilitate the self-management of patients with diabetes and thus the treatment of chronic diseases. The pilot applications in Germany and Turkey will demonstrate that the holistic and patient-centric approach of EMPOWER can improve disease management by personalised self-management services helping diabetes patients to cope better with their condition.

¹ <http://www.hl7.org>

² <http://www.ihe.net>

3 EMPOWER Disease Management

This section describes the usage of the EMPOWER Disease Management component and represents the user manual for diabetic care providers.

EMPOWER aims to support diabetes patients in defining and – more important – achieving their health goals. By collecting and evaluating data related to the patient's physical and mental situation, the patient's self-management awareness allows a self-assured dialog with his or her medical care provider. The EMPOWER disease management portal supports physicians by a recommender engine based on national diabetes guidelines.

The medical care providers, e.g. doctors, diabetic assistants are linked into this process by providing the patients with recommendations and evaluating the collected data from the patients from a medical perspective.

3.1 Login

For using EMPOWER it is required to login with your personal credentials. The disease management portal deals with highly sensitive personal and medical data. Therefore, each access to the portal is controlled. If the required login credentials are missing, a login page is displayed to the user – see Figure 1. Depending on the used EMPOWER installation, either Turkey or Germany, the Login Page may differ slightly.

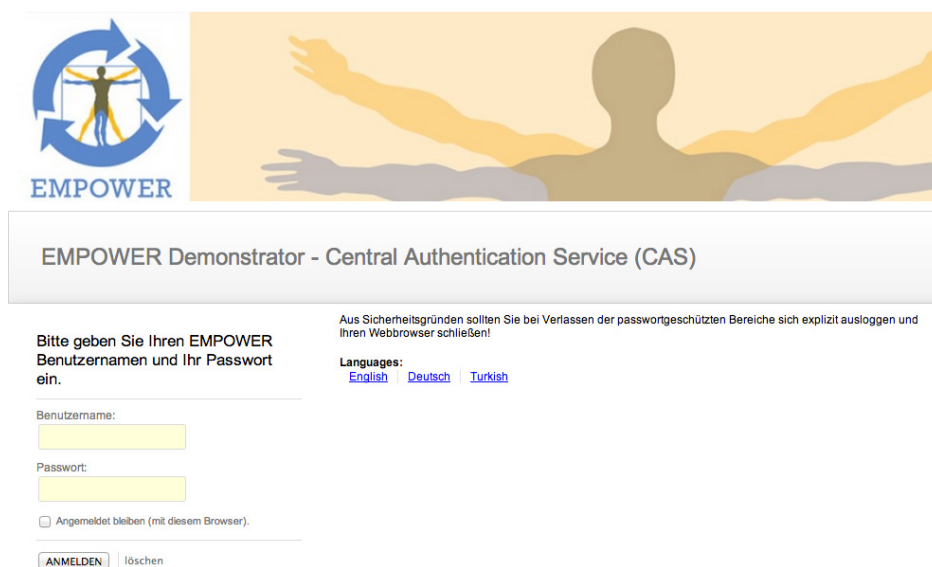


Figure 1: Login Page (Demonstrator Installation)

Both username and password are provided to the user during the patient/care provider registration or – depending on the integration with existing PHR system – are used from the external system. For login please use the following URL:

Installation	URL
EMPOWER Prototype	https://demo.empower-fp7.eu/empower/
Turkish Prototype	http://www.empower-tr.eu
German Prototype	https://empower.goin.info

After successful login, you will be redirected to the EMPOWER home screen.

3.2 Home Screen

After the successful login, the home screen of the EMPOWER disease management portal is shown. In the upper area of the screen you find the menu bar. With the menu bar, all the functions of the EMPOWER disease management portal are available. The EMPOWER web portal provides a single access point for both patients and doctors. Depending on the role of the user the portal shows either the functionality for the patient or for the medical care provider. When a medical care provider connects to the system, his/her home screen showing the available options is displayed, see Figure 2.

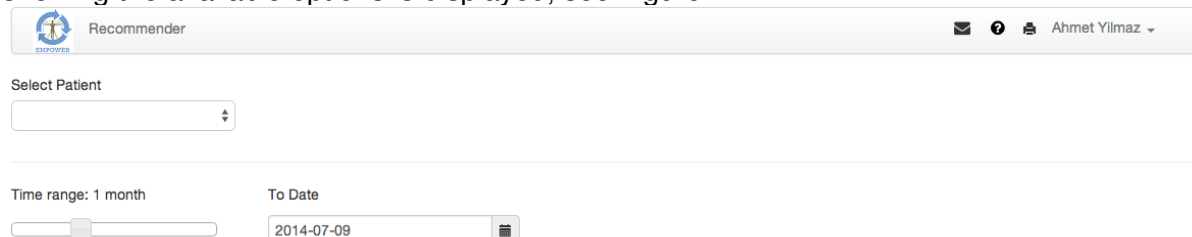


Figure 2: Home Screen

Note: The menu bar showing your logged-in name and the available options is visible at any time. By using the EMPOWER logo on the left side of the menu bar, the home screen is opened again.

With the home screen you can get a quick overview of your patients by selecting a patient from the list (see Section 3.2.2 for further details). Your second option is the Recommender Engine, which allows a step-by-step examination of the patient's data in comparison with particular Diabetes Guidelines.

3.2.1 Settings

The EMPOWER user profile captures personal preferences and individual setting. You can specify your preferred language as shown in Figure 3. The following languages are supported: *German, English* and *Turkish*.

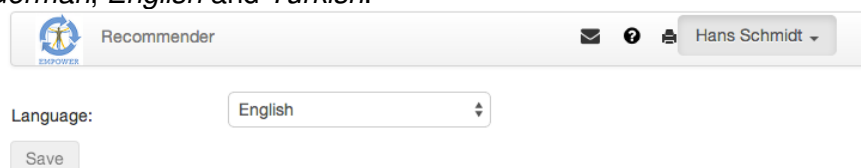


Figure 3: Settings, specify Language

After changing the language setting, the Home Screen is displayed in the desired language.

3.2.2 Select a patient

When the home screen is shown (see Figure 2), you may select a single patient from the list of assigned patients. Additionally, you may choose the desired time range to verify the patient's data, as already shown in Figure 2. Given the consent of the patient, the system shows the patient's recordings such as occurred problems or the latest blood glucose values (see Figure 4).

Problems Summary									
Date	Problems					Sleep Symptoms			
8.7.2014	Palpitation					I have been in pain - feet, sole of the feet, calf of the leg, elsewhere?			
	Pain (head, chest, legs, feet, soles, thighs)					I had restless legs			
						I was thirsty			

Blood Glucose (weekly averages)									
Date	Breakfast			Lunch			Dinner		
	Insulin	BG-Pre	BG-Post	Insulin	BG-Pre	BG-Post	Insulin	BG-Pre	BG-Post
2014-07-08 - 2014-07-14	5	134	137	3	146	226	-	-	185
2014-07-15 - 2014-07-21	3	-	137.5	-	-	182.4	-	-	-
2014-07-01 - 2014-07-07	-	-	-	-	-	205	-	-	-
2014-07-08 - 2014-07-14	-	-	-	-	-	222	-	-	-

Figure 4: Patient's Problem and Blood Glucose Summary (Example)

In addition to the Blood Glucose Summary, a diagram outlining the patient's weight recordings is shown.

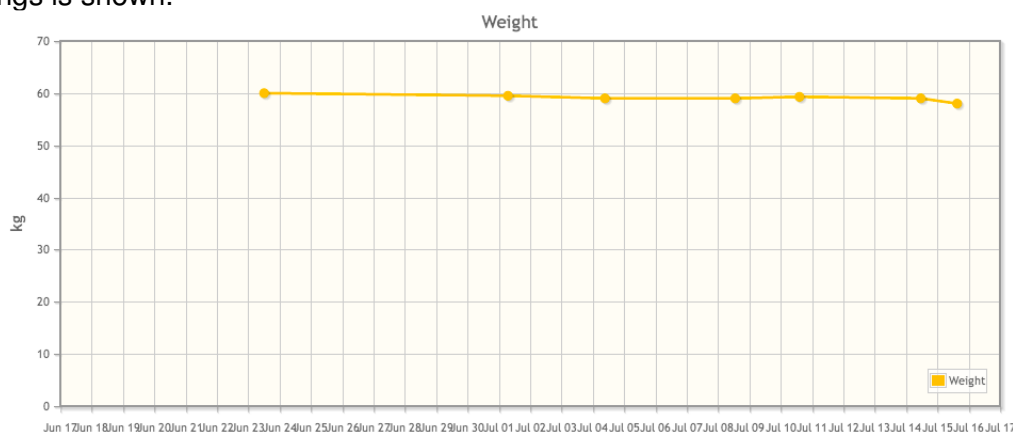


Figure 5: Weight Chart

These diagrams provide an initial overview of the patient's development. You can get more insights by examining the provided charts as explained in section 3.2.3

3.2.3 Patient Charts

For analysing additional data a diagram of choice can be selected from the Select Chart list. The selected chart is displayed at the bottom of the page. Currently, the following diagrams/charts can be displayed:

Chart Name	Chart Description
Blood Glucose	Displays a combined line chart outlining the recorded values for <ul style="list-style-type: none"> Fasting Blood Glucose Postprandial Blood Glucose Administration of Insulin
Blood Glucose Summary	Shows the average values of the Blood Glucose (pre- and post-prandial) and Insulin administrations for the past weeks in a tabular view)
Blood Pressure	Shows a combined line chart with the values for <ul style="list-style-type: none"> Pulse Systolic Blood Pressure Diastolic Blood Pressure
Weight	Shows the weight recordings

Body Mass Index	Shows the (computed) BMI along with the Norm Range for BMI
Mood & Stress	Shows the mental parameters of recorded values (mood and stress level)
Problems Summary	Shows the recorded problems (including symptoms recorded with sleep ODLs) in a tabular view
Nutrition	Shows components of recorded values i.e. Fat, Fiber, Calories, Carbohydrates, Sugar, Protein
Physical Activity	Shows Intensity, Duration and Steps recorded for Physical Activities
Blood Glucose and Physical Activity	Displays a combined chart outlining the recorded values for Blood Glucose combined with Duration and Steps recorded for Physical Activities

Table 1: Available Chart Types

Fehler! Verweisquelle konnte nicht gefunden werden.+7 present chart examples, namely for blood glucose combined with physical activities and the blood pressure.

Select Chart

Blood Glucose & Physical ac' ▼

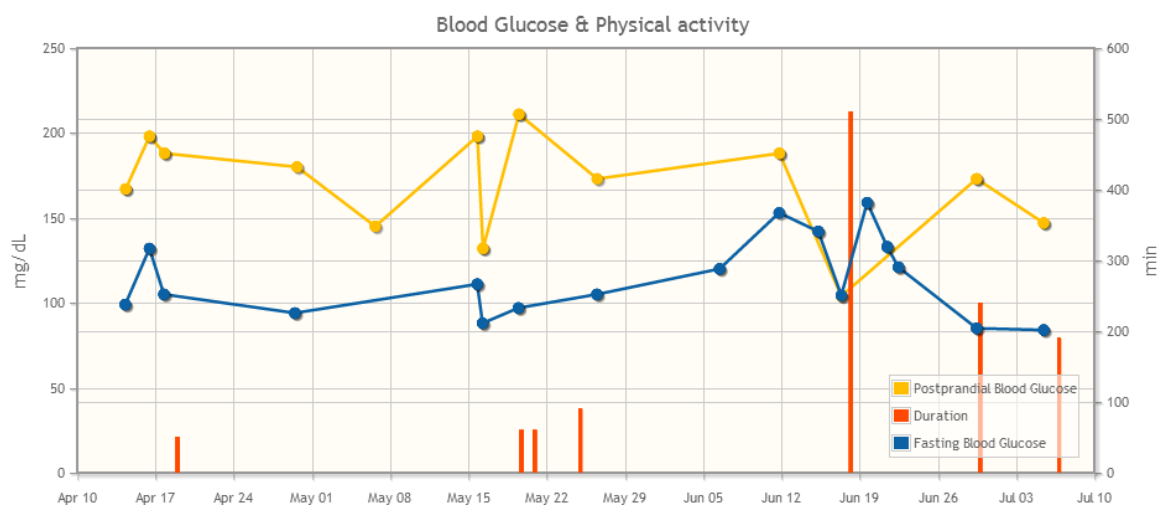


Figure 6: chart for Blood Glucose and Physical Activity

Select Chart

Blood Pressure ▼

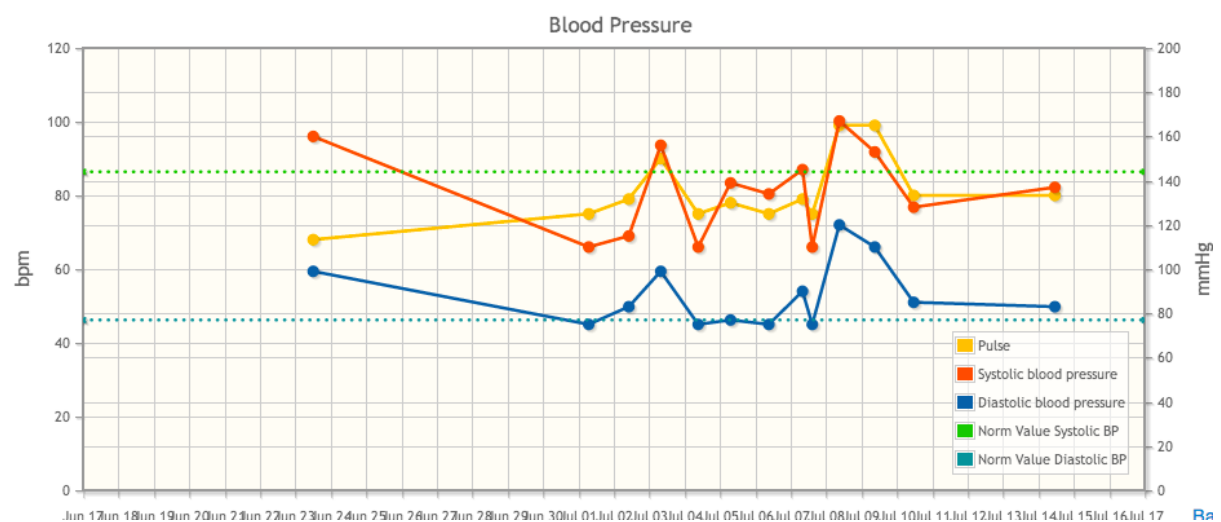


Figure 7: Chart for Blood Pressure

3.3 Recommender Engine

The Recommender Engine helps the medical professionals to carry out best practice clinical guidelines. Normally, the clinical guidelines are in textual format, but in EMPOWER project they are developed to be machine processable so that the medical professionals can execute them step-by-step like a workflow.

The Recommender Engine screen is displayed in the Figure 7. The functionality of the buttons is as follows:

- **Guideline:** The available guidelines are displayed when clicking this button. Currently, there are four guidelines: Three guidelines for Turkey and one guideline for the treatment of the newly diagnosed Type 2 patients in Germany.
- **Assignment:** The guidelines can be assigned to the patients here. In order to execute a guideline, it should be assigned to a patient. In this section, the guidelines can be assigned to related patients.
- **Engine Status:** Either the current executing guidelines or previously executed guidelines are displayed here. In this section, the doctors can see the status of the Recommender Engine in terms of executing and executed guidelines.
- **Recommendations:** This section provides the recommendations of previously executed guidelines. Here, the doctors can examine their previous decisions (approved recommendations) about the patients.

In the following subsection, a sample run to execute a clinical guideline is presented. For ease of use, the redirection of the above mentioned sections are performed automatically. After the “Sample Run” subsection, these windows are presented briefly.

3.3.1 A Sample Run

Click the **Recommender** button on the top of Figure 7. As the start page, the Patient Selection is presented as shown in Figure 7. Here first click the “Select Patient” button and select a patient. When the patient is selected, the patient name is displayed together with the patient ID.

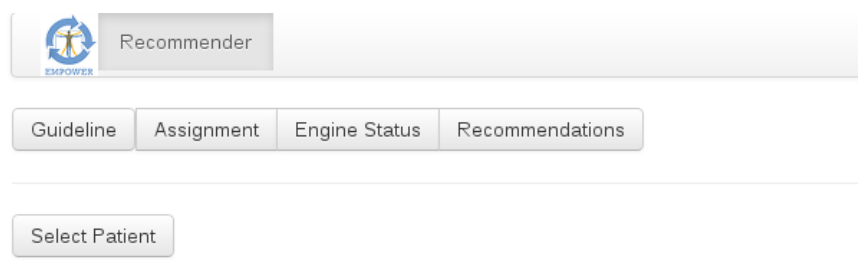
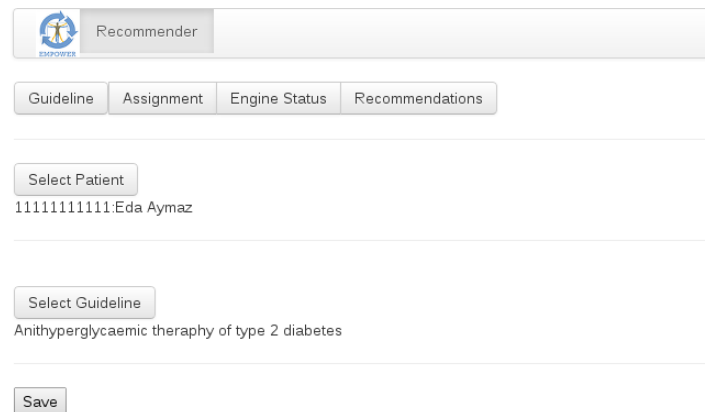


Figure 8: Recommender Engine Screen

After that select the guideline to be executed and click the Save button as shown below. There are four guidelines:

- One for the treatment of the newly diagnosed Type 2 patients in Germany
- One for the diagnosis of diabetes in Primary Care in Turkey
- One for the treatment of the newly diagnosed Type 2 patients in Secondary Care in Turkey

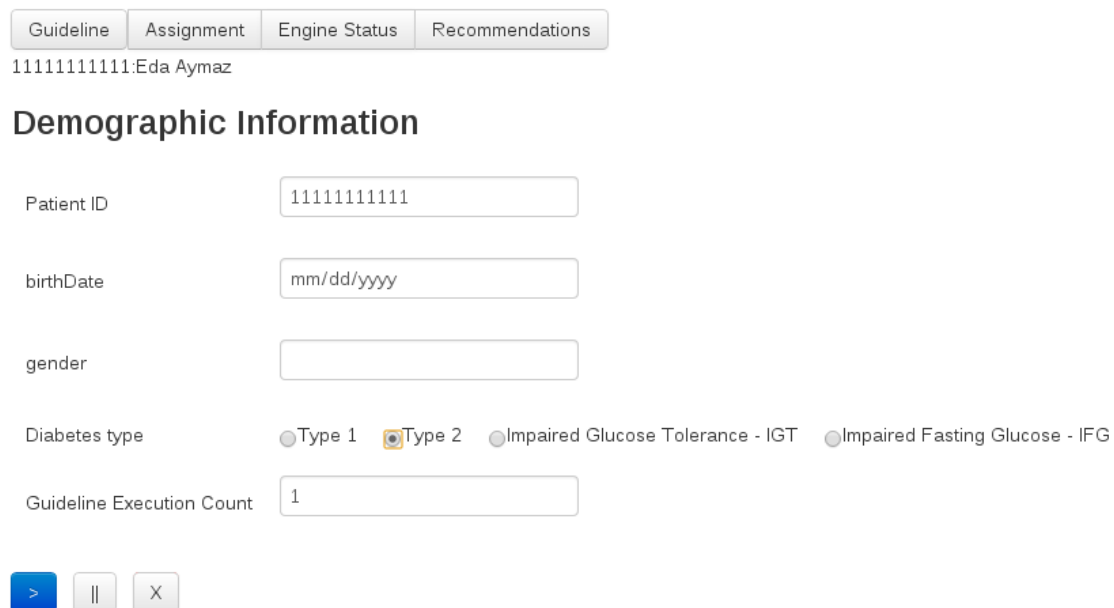
- One for the monitoring of the diabetes patients in Tertiary Care in Turkey



The interface shows a 'Recommender' header with an EMPOWER logo. Below it are four tabs: 'Guideline', 'Assignment', 'Engine Status', and 'Recommendations'. The 'Assignment' tab is active. Under this tab, there is a 'Select Patient' button followed by the text '1111111111:Eda Aymaz'. Below that is a 'Select Guideline' button followed by the text 'Anithyperglycaemic therapy of type 2 diabetes'. At the bottom is a 'Save' button.

Figure 9: Assignment window

The guideline execution starts immediately by displaying the corresponding fields to the doctor. The guidelines are normally executed step-by-step. At each step necessary forms are displayed to the doctors. Previously entered data are shown to them and doctors are allowed to edit those data or enter new values to empty fields. You can navigate through the steps with “>” (Next Step) and “<” (Back Step) buttons. You can pause the instance with “||” button whenever you want and abort the execution with “X” button as shown below.



The interface shows four tabs: 'Guideline', 'Assignment', 'Engine Status', and 'Recommendations'. The 'Assignment' tab is active. Below the tabs is the patient identifier '1111111111:Eda Aymaz'. The main section is titled 'Demographic Information'. It contains several input fields: 'Patient ID' with the value '1111111111', 'birthDate' with the placeholder 'mm/dd/yyyy', 'gender' (empty), 'Diabetes type' with four radio buttons (Type 1, Type 2, Impaired Glucose Tolerance - IGT, Impaired Fasting Glucose - IFG), and 'Guideline Execution Count' with the value '1'. At the bottom are three buttons: a blue '>' button, a grey '||' button, and a grey 'X' button.


Figure 10: An example step in guideline execution

Some input fields have a graphic icon next to it (like below):



The interface shows a label 'Weight' next to an input field containing the value '60'. To the right of the input field is a small icon representing a line graph with multiple data series.

Figure 11: Displaying the visualization charts

You can click the  at the end of the line to visualize the chart of the value. An example weight chart is shown below.

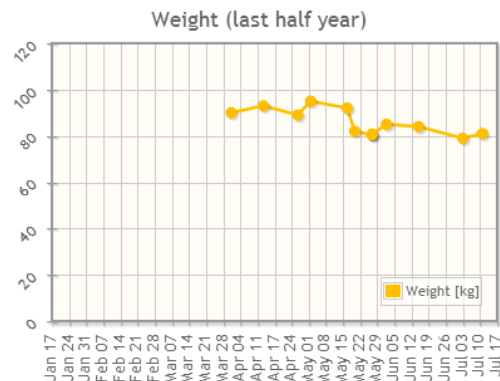


Figure 12: Weight Chart on Guideline Form

After the execution is completed, you will see the guideline finish screen as in the following figure. During the execution, based on the values entered by the doctors, the Recommender Engine performs some calculations and generate auto-recommendations specific to the patients. At this step, the doctors normally need to go to the recommendation section, review them and approve the related ones to be sent to the patients.

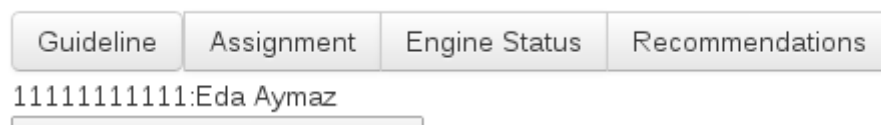





Figure 13: Guideline finish screen

When you click the button below the patient name, the corresponding recommendations will be displayed to you. In this page you can edit/delete/approve recommendations. You can delete, edit or approve the recommendation by clicking the buttons by given order. To be

more specific  button deletes the recommendation,  button edits the recommendation and  button approves the recommendation. In addition to self-management recommendations (which will be sent to the patients) there may be treatment recommendations, which are specifically for the medical professionals.











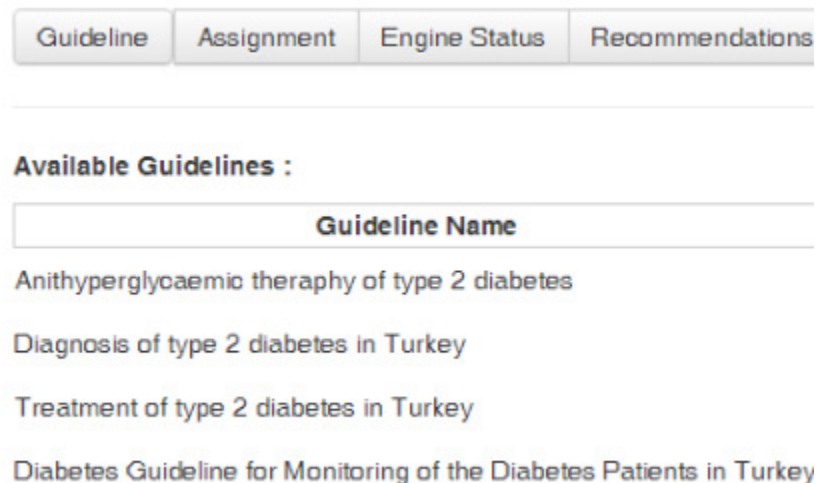
Diabetes Guideline for Monitoring of the Diabetes Patients in Turkey:		
Recommendations	Type	
HBA1c test should be performed every three months and it should be less than 6.5%	self-management	  
Eye, heart, kidney, teeth and foot examination by a physician should be performed every year	self-management	  
Each patient should get the flu vaccine every year	self-management	  
Normal patients (diabetes patients who have no other serious problems) should take 45 min brisk walk three times in a week	self-management	  
Normal patients should increase daily movement (e.g. not using elevator, going to shopping by walk, get off the bus (or metro) at the previous stop)	self-management	  
Patient has hypertension and should do active exercise at home if the weather is too hot or too cold	self-management	  
Patients having knee replacement should not do brisk walking	self-management	  
If the glucose measurement is more than 250, the patient should not do exercise at that moment	self-management	  
The exercise should be done at least 1.5 hours before meals	self-management	  

Figure 14: Recommendations

3.3.2 Guideline Section



Guideline Assignment Engine Status Recommendations

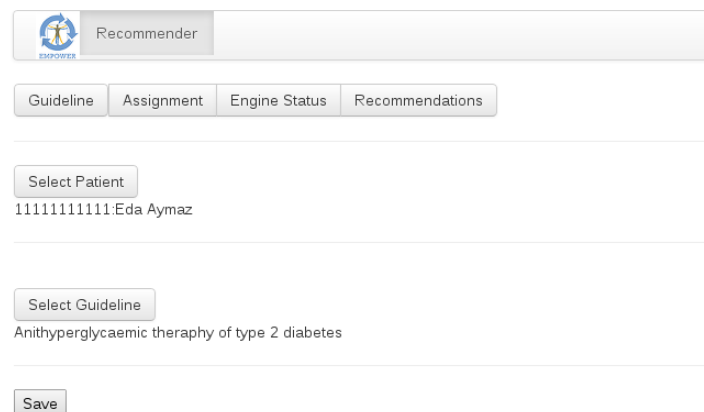
Available Guidelines :

Guideline Name
Anithyperglycaemic therapy of type 2 diabetes
Diagnosis of type 2 diabetes in Turkey
Treatment of type 2 diabetes in Turkey
Diabetes Guideline for Monitoring of the Diabetes Patients in Turkey

Figure 15: Available guidelines

The available guidelines are displayed to the medical professionals as shown above. In the scope of EMPOWER project, one guideline „Antihyperglycaemic therapy of type 2 diabetes“ is developed for German pilot and three guidelines are developed for Turkey. You can find details about these guidelines in the EMPOWER's public deliverable „Deliverable 5.2.1 Diabetes based Personalised Adaptive Recommender Engine Prototype 1“³.

3.3.3 Assignment Section



Recommender

Guideline Assignment Engine Status Recommendations

Select Patient
1111111111:Eda Aymaz

Select Guideline
Anithyperglycaemic therapy of type 2 diabetes

Save

Figure 16: Assignment Screen

For executing the guideline, first it should be assigned to a patient. When the button „Select Patient“ is clicked the consented patients are displayed. After selecting the patient, the available guidelines are presented. You can make the assignment by clicking the „Save“ button.

3.3.4 Engine Status Section

³ See <http://www.empower-fp7.eu/publications/public-deliverables/>

Guideline	Assignment	Engine Status	Recommendations
-----------	------------	---------------	-----------------

Engine Status :



Patient ID	Patient Name	Guideline Name	Creation Time	Status	Action
code-targetperson	MANFRED MAIER	Anithyperglycaemic therapy of type 2 diabetes	Fri Jan 03 17:05:00 EET 2014	Not Started	 

Figure 17: Engine Status Section

In this window, you can see all executing/executed/aborted guidelines, too. If required, you resume a guideline instance as well.

3.3.5 Recommendations Section

Guideline	Assignment	Engine Status	Recommendations
-----------	------------	---------------	-----------------

Recommendations :


Patient ID	Patient Name	Guideline Name	Status	Creation Time	
code-targetperson	MANFRED MAIER	Anithyperglycaemic therapy of type 2 diabetes	Unknown	Fri Jan 03 17:05:00 EET 2014	

Figure 18: Recommendations Section

In this section, all the previously successfully finished guidelines' recommendations are presented. You can go over the list and examine the past recommendations to his patients.

3.4 Information materials for patients

German Pilot info material and bookmarking site

- EMPOWER Info material <http://empowerpatientde.wordpress.com/>
- Bookmarks of any info material <https://groups.diigo.com/group/empowerde/>

Turkish Pilot info material and bookmarking site

- EMPOWER Info material <http://empowerpatienttr.wordpress.com/>
- Bookmarks of any info material <https://groups.diigo.com/group/empowertr/>

3.4.1 Bookmarking information materials on the web

Patients and medical staff can join the bookmarking group to add or view bookmarks. The bookmarks are available either ia the direct link above or within the patient portal. It is likely that a clinical administrator periodically bookmarks approved material suggested by the medical staff. The bookmarked materials are public and accessible by the EMPOWER patient portal, however, only registered group members can add bookmarks to the group. One or more moderators will be assigned from your clinic to moderate this group and will be responsible to invite or add new members to the group.

3.4.1.1 Moderating the patient bookmarks by an clinical administrator

Should patients create bookmarks or only doctors or clinical staff?

It is desired that patients add and share bookmarks; however, it is not required. Alternatively, staff members and doctors can create bookmarks to useful materials. For example, the clinic site and materials should be bookmarked.

How can a staff member or validation pilot administrator moderate the group?

A signup URL can be forwarded to anydesignated moderators from the bookmarking account owner, currently SRFG. The moderator can then either send invitations to patients or a

patient might ask to join via the group site. The moderator can remove, modify or add bookmarks.

Who can moderate a bookmarking group?

A clinical staff member or administrator working with the patient group can moderate the group. This person is allowed to invite patients via email to join the commercial bookmarking service.

What does the moderator do?

The main tasks are as follows:

1. Invite users by email (Figure 19, clue 1) or go to group settings and manage users (Figure 21, clue 3 + 4) who requested to join via the bookmark page.
2. Select group settings (Figure 19, clue 1) and create a pre-defined dictionary of bookmark tags (Figure 22)
3. Manage bookmarks (remove, add or remove tags) submitted by users (Figure 19 clue 3 and Figure 20 clue 1+2)
4. Add any bookmarks desired by your clinic or doctors.

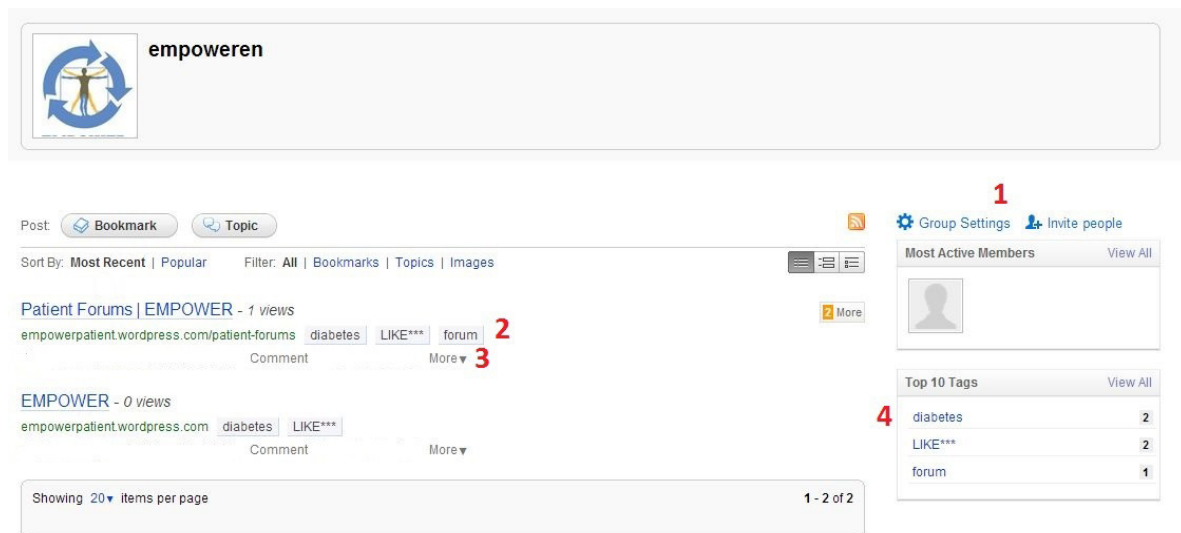


Figure 19: The bookmark list for moderators. Manage bookmarks and users.

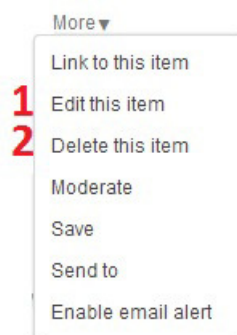


Figure 20: Manage a bookmark. Remove it or edit the tags

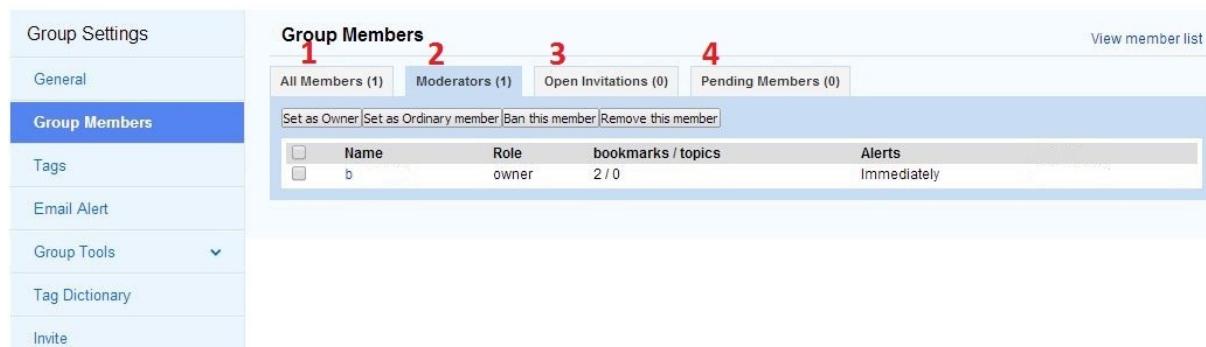


Figure 21: Manage users. Allow new users in the group

The clinics should control their bookmarking group and decide with the patients how patients can access the bookmarks after project ends. The bookmarks are public and if nothing is done, they will continue to be available. The group bookmarks can also be downloaded for backup or reimported into another group.

3.4.1.2 The Tag Dictionary

The Tag Dictionary (see Figure 22) allows the group manager to pre-define a tag dictionary to encourage tagging that is consistent with a simple controlled vocabulary. The tag dictionary will automatically appear each time a user tries to bookmark a resource. This helps patients organize and discover materials.

The moderators should create the initial tagging dictionary supporting a simple controlled vocabulary and include tag for rating information material tags; rating tags are LIKE, LIKE***, DIFFICULT, and DIFFICULT***.

Note: the tags may change depending of the used language or the tag dictionary of the pilot installation. It is up to the group moderator to set a tagging policy that is best for their patients.

LIKE is well understood by many users, and in context of information materials, a resource that is liked is useful or relevant to the patient or doctor. It is suggested to use two levels: *LIKE* and *LIKE****, where the starts *** implies a stronger meaning. However, info material rated as DIFFICULT might be difficult to read for whatever reason. In combination, a patient might **like** the material very much, but she rates the material as **difficult** because of either the medical language used or the time it took to read and comprehend the information. A resource that is not tagged with a DIFFICULT tag is assumed to be readable to the user.

Tag Dictionary

Invite

Choose a pre-defined set.

goals

+ Add Tags

[Space separated. Use "" for tag with multiple words]

askdoctor [Edit] [Delete]

questions [Edit] [Delete]

problems [Edit] [Delete]

hba1c [Edit] [Delete]

Weight [Edit] [Delete]

DIFFICULT*** [Edit] [Delete]

DIFFICULT [Edit] [Delete]

LIKE*** [Edit] [Delete]

LIKE [Edit] [Delete]

lifestyle [Edit] [Delete]

nutrition [Edit] [Delete]

sport [Edit] [Delete]

diabetes [Edit] [Delete]

forum [Edit] [Delete]

Figure 22: Create a pre-defined dictionary of bookmark tags

4 Patient Portal

This section describes the usage of the EMPOWER Patient Portal including the EMPOWER mobile application for smartphones and represents the user manual for diabetes patients.

EMPOWER aims at supporting diabetes patients in defining and – more important – achieving their health goals. By collecting and evaluating data related to the patient's physical and mental situation, the patient's self-management awareness allows a self-assured dialog with his or her medical care provider.

4.1 Login Patient Portal

For using the EMPOWER Patient Portal a login is required. The Patient Portal deals with highly sensitive personal and medical data. Therefore, the login procedure protects the user of a non-authorized access. Both username and password are provided to the patient during the patient registration. Depending on the used EMPOWER installation, either Turkey or Germany, the Login Page may differ slightly.

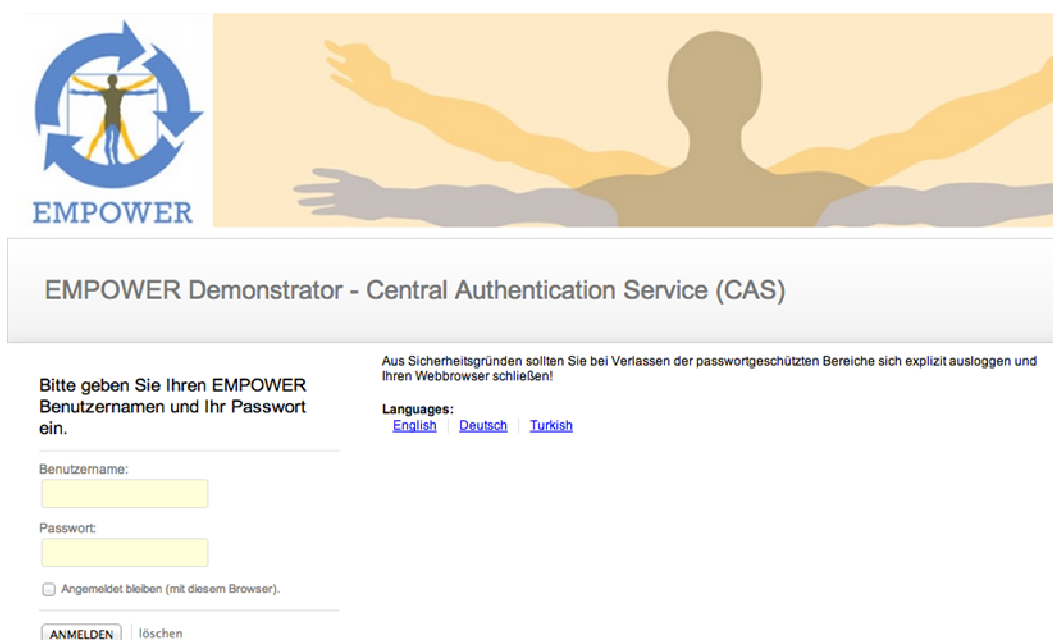


Figure 23: Login Page (Demonstrator Installation)

Both username and password are provided to the patient during the patient/care provider registration or – depending on the integration with existing PHR system – are used from the external system. For login please use the following URL:

Installation	URL
EMPOWER Prototype	https://demo.empower-fp7.eu/empower
Turkish Prototype	http://www.empower-tr.eu
German Prototype	https://empower.goim.info

After successful login, you will be redirected to the EMPOWER Home Screen.

4.2 Home Page

After successful login, you will be redirected to the EMPOWER home page.

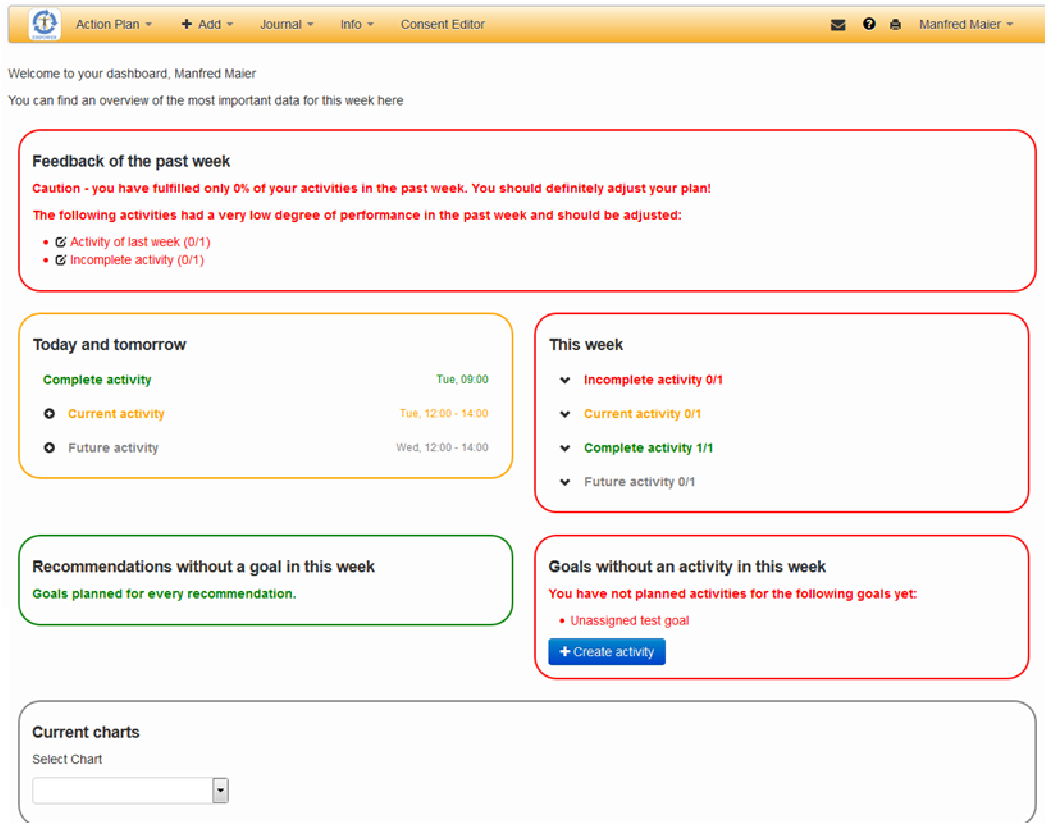


Figure 24: EMPOWER home page

In the upper area of the screen you find the menu. With the menu bar, all the functions of the EMPOWER patient portal are available.

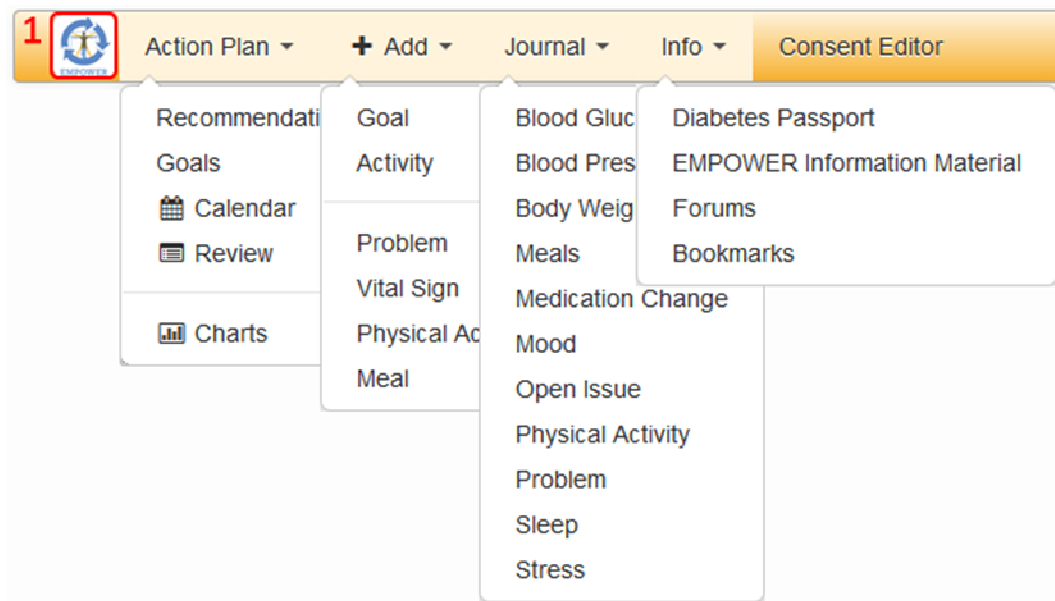


Figure 25: menu bar overview

The main menus also contain several sub-menus as shown in Figure 25. The distinct menu items are as follows:

- **Action Plan:** Allows you to review the recommendations of your medical care provider, your personal goals, typically based on the doctor's recommendations, opens your calendar with your activities, offers you a review of the past activities and give access to charts. In addition, you may define your personal goals and plan your activities.
- **Add:** Provides „shortcuts“ to the most often used functions when managing targets and planning activities.
- **Journal:** Collects and reviews your data.
- **Info:** Provides additional information with respect to diabetes and its implications.
- **Consent Editor:** Grants or denies access to your medical care providers.

When choosing (clicking) one of the functions, the system loads data from the EMPOWER system or stores your input. During the processing, the menu bar shows a global “activity” symbol (see Figure 26). As long as the activity symbol is visible the processing of your requests is not yet finished.



Figure 26: Logged Username, Activity Symbol

When you choose the mail icon (see Figure 27), a list of active messages, such as reminders, will be presented. The mail icon will indicate new messages in terms of a red number and after opening the list the user can see all unread messages and read messages when scrolling down. By clicking on a message the user is provided with additional information and the message is marked as read. All activity reminders or other messages will be sent to the user inbox, however, the user can also send reminders to an email address from the patient registration information created by an EMPOWER clinical administrator of the pilot study.

Note: To ensure patient safety, only the administrator can change the email address!



Figure 27: User inbox

When you choose the help icon (see Figure 28) this document, the User Manual and other help material will be presented.

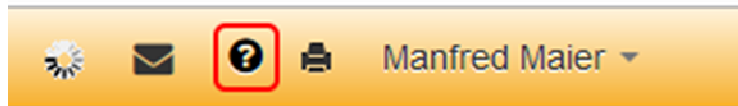


Figure 28: Help

When you choose the print icon (see Figure 29) you can print the current page.



Figure 29: Printer

The EMPOWER logo (see Figure 25, clue 1) within the menu bar opens the home screen again. The homepage includes a dashboard giving you an overview of your most important data for the current week. All items are colour coded using the following pattern:

- Green – Everything is complete/okay
- Orange – Something should be in progress at the moment
- Red – Something is incomplete/wrong
- Grey – Something to come up in the future / additional information

The items to be shown at your dashboard can be configured in the settings (see section 4.3). Figure 30 gives an overview about the dashboard items:

- Feedback of the past week – points out when you did a good job in the last week (e.g. you completed most or all of your planned activities) or when your performance was quite low and should be improved. Activities and goals with a low degree of performance are listed and can be adjusted by using the corresponding edit icons (see Figure 30, clue 1)
- Today and tomorrow - lists current and upcoming events of today and tomorrow. The user can enter results for incomplete events by using the corresponding add icons (see Figure 30, clue 2)
- This week – gives a quick overview of activities of the current week. The user can display the associated events by using the corresponding toggle icons (see Figure 30, clue 3)
- Recommendations without an activity in this week – gives you an overview of the recommendations where no goals are assigned for this week. Maybe there are good reasons for not-assigning them but in the long run you should also assign goals to them (see Figure 30, clue 4)

- Goals without an activity in this week – gives you an overview of the goals where no activities are planned for this week. Maybe there are good reasons for not-planning them but in the long run you should also plan activities for them or modify your goals accordingly (see Figure 30, clue 5)
- Current charts – the user can display a chart for the past week by selecting a chart type (see Figure 30, clue 6)

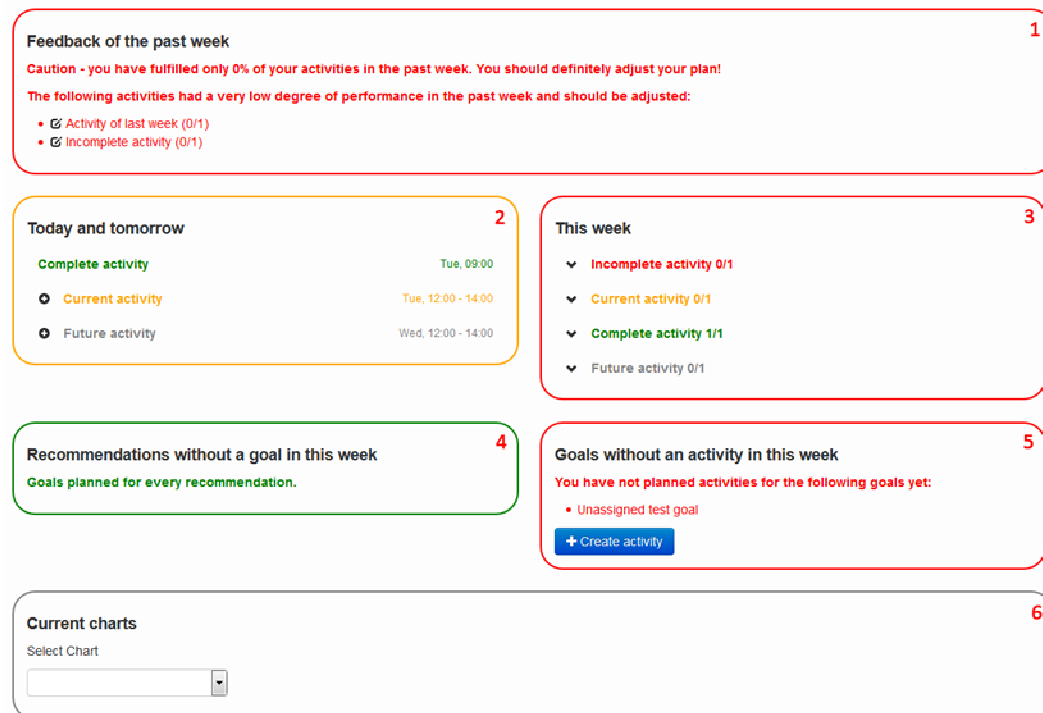


Figure 30: Overview homepage items

4.3 Settings

In the Settings (see Figure 31) you can configure the following items:

The screenshot shows a 'User settings' form with the following elements highlighted by numbered red boxes:

- 1**: Language dropdown menu set to 'English'.
- 2**: Height input field with a unit dropdown set to 'cm'.
- 3**: Meals section with a 'Select meal' dropdown and an 'Add meal' button.
- 4**: Thresholds section containing input fields for:
 - Blood glucose before a meal (lower threshold): 100 mg/dL
 - Blood glucose before a meal (upper threshold): 125 mg/dL
 - Blood glucose after a meal (lower threshold): 140 mg/dL
 - Blood glucose after a meal (upper threshold): 199 mg/dL
 - Systolic blood pressure (upper threshold): 140 mmHg
 - Systolic blood pressure (upper threshold): 80 mmHg
 - Body Mass Index (lower threshold): 18.5 BMI
 - Body Mass Index (upper threshold): 25 BMI
- 5**: First hour in the calendar input field set to 8 h.
- 6**: Dashboard elements section with a list of checkboxes:
 - ☒ Feedback of the past week
 - ☒ Today and tomorrow
 - ☒ This week
 - ☒ Recommendations without a goal in this week
 - ☒ Goals without an activity in this week
 - ☒ Current charts

A 'Save' button is located at the bottom of the form.

Figure 31: User settings

- **Language** – possible languages are English, German and Turkish (see Figure 31, clue 1)
- **Height** – Height (see Figure 31, clue 2) is necessary for calculating your BMI (Body Mass Index). By storing it the user does not have to provide it as part of the journal for collecting your body weight (see section 4.8)
- **Meals** – Meals can be used as part of the meal journal. By choosing “Add meal” the user is provided with a form to enter the meal name and its food items similar to the meal journal edit form (see section 4.8). Saved meals can be edited/deleted by selecting a meal and choosing the “Edit meal”/“Remove meal” buttons that appear (see Figure 31, clue 3),
- **Thresholds** – you can insert thresholds (see Figure 31, clue 4), e.g. when your doctor tells you a lower and an upper threshold for blood glucose or for blood

pressure. These thresholds will be used in the charts for visualising whether your values are within a threshold area respectively below or above a threshold.

Note: These thresholds are a default values based on literature. Please contact your treating physician for specifying individual thresholds tailored for your situation and adapted to your needs.

- **First hour in the calendar** – you can insert the first hour of a day to be visualised in the calendar. This way you can adjust the calendar visualization to your daily routine. You can still scroll to an earlier/later time (see Figure 31, clue 5)
- **Dashboard elements** – you can indicate which elements should be presented at your dashboard (see Figure 31, clue 6)

4.4 Action Plan

The Action Plan allows you to list, evaluate, edit and review the relevant personal information. This includes the recommendations of your medical care provider, the management of personally defined goals and also the management of planned activities (to achieve the defined goals).

4.4.1 Recommendations

This menu item lists the patient's personal recommendations from his/her doctor (see Figure 32 , clue 2). Additionally, you can add own recommendations (see Figure 32 , clue 1 and clue 3), e.g. from a health professional not using the EMPOWER application. These recommendations can be edited/deleted by choosing the corresponding edit/delete icons.

My recommendations for self-management from my doctor(s)

+ Add recommendation ¹		
Date	Care Provider	Recommendation
02/08/2012	Hans Schmidt	Take the medications every morning.
02/08/2012	Hans Schmidt	Measure and record blood sugar and blood pressure daily.
02/08/2012	Hans Schmidt	Check your weight on Sunday morning before breakfast.
02/08/2012	Hans Schmidt	Change your eating behaviour within the next two months.
02/08/2012	Hans Schmidt	Do some sports.
02/08/2012	Hans Schmidt	Lose 5 kg.
07/21/2014	Myself	Drink less coffee (Added by Manfred Maier) ³

Figure 32: Recommendations

Any of the recommendation may further be combined with personal goals. This is to report progress to the medical care provider.

4.4.2 Goals

Often the recommendations of the medical care providers are more general, e.g. "Do some sports" or "Reduce weight". To react to those recommendations, the EMPOWER patient's portal allows you to define concrete individual goals tailored to your specific requirements and needs, e.g. "10 km running each week". To finally achieve the personal goal, you may later assign planned activities to the personal goals.

First, the already stored goals are listed (see Figure 33, clue 1). The colour coding implies the planning status for the current week (green: activities are linked to this goal in the current week, red: no activities are linked to this goal in the current week). By using the button “Create personal goal”, new goals may be added (see Figure 33, clue 2). In a guided wizard (see section 4.6.1 for details), you can describe your goals and also add some motivating gratifications (when the goal finally has been reached). After finishing the wizard, the new goal is immediately shown in the list of personal goals.

My Personal Goals

+ Create personal goal 2				
Date	My Goals	Goal Description	Motivations	Comment
07/15/2014 🗑️ 📅	Meditation	Meditate daily after work	City trip to Rome in August	1
07/22/2014 🗑️ 📅	Marathon	Be able to participate in a marathon in December	Summer vacation on Bora Bora	

Figure 33: Personal goals

It is also possible to edit/delete existing goals by choosing the corresponding edit/delete icons. When editing existing goals, the user has to pass through the guided wizard again.

4.4.3 Calendar

The purpose of the Calendar is twofold – It serves for the planning of activities supposed to help to achieve the goals defined before and if the planning of activities is done it gives an overview of already planned activities. As an example, it is feasible to plan several running units in order to achieve the previously defined goal of “10 km running per week”.

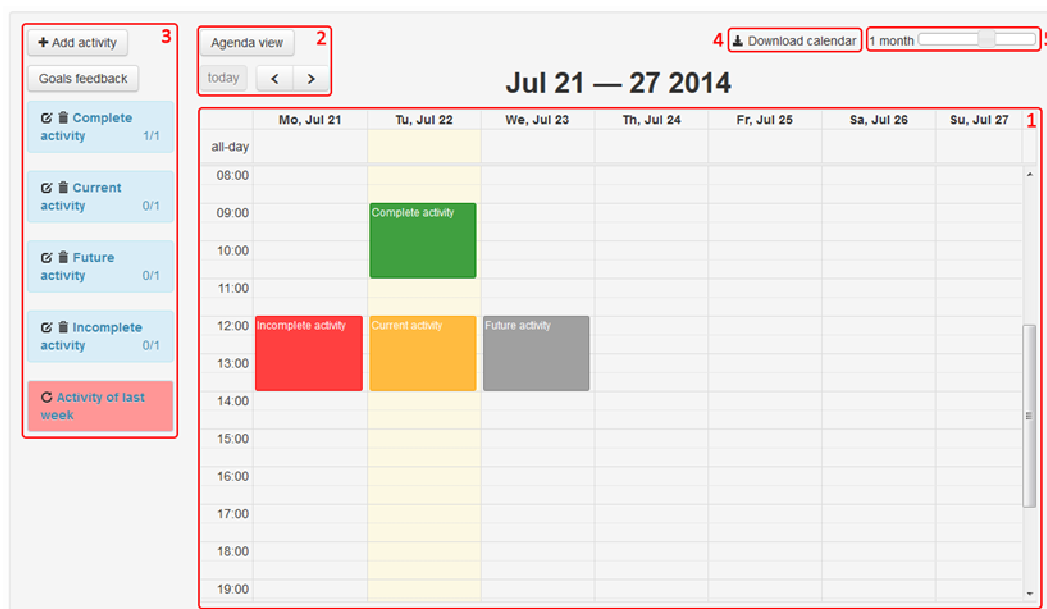


Figure 34: Calendar Application

The Calendar Application lists all planned activities (see Figure 34, clue 1). The week may be adjusted by using the navigation arrows (see Figure 34, clue 2). New activities can be added by choosing “Add activity” (see Figure 34, clue 3) or clicking on an empty calendar slot. Existing activities can be edited/deleted by choosing the corresponding edit/delete icons of the activities highlighted in blue (see Figure 34, clue 3). Furthermore, past activities may be

reactivated by choosing the corresponding repeat icons of the activities highlighted in red (see Figure 34, clue 3). For further information about adding activities see section 4.6.2

By clicking on a calendar event you are provided with a dialog showing activity details (see Figure 35). You can see the status of the selected event, the completion rate of the activity and a visualization of associated recommendations and goals when toggling “Show associated recommendations and goals”. In case the event is not yet complete you can also enter results in terms of a dialog (see section 4.8 for details) or edit the activity.



Figure 35: Activity details

Usually, each activity is assigned to a personal goal. When you press the button “Goals feedback” (see Figure 34, clue 3) you can see which activities are associated to which goals (see Figure 36). Furthermore, you can see the degree of fulfilment for goals in the current week. Whenever an activity is performed (and recorded) the progress for this particular goal is adjusted.

Goals feedback			
Your goal feedback			
My Goals	Performance	Associated activities	Tips
Assigned test goal	50% (1/2)	<ul style="list-style-type: none"> Current activity Complete activity 	
Assigned test goal 2	0% (0/1)	<ul style="list-style-type: none"> Current activity 	

Figure 36: Goals feedback

As shown in Figure 34 the distinct activities are coloured differently and marked with symbols: Activities coloured in blue represent current or future activities. They may be edited or deleted. Activities coloured in red represent out-dated, past activities. They may be reactivated.

The calendar events are coloured too. Green represents completed events, orange represents events that are in progress, red represents incomplete events and grey represents events that are in the future.

Stored activities may be shown in an agenda view (see Figure 37) by pressing the button “Agenda view” (see Figure 34, clue 2).

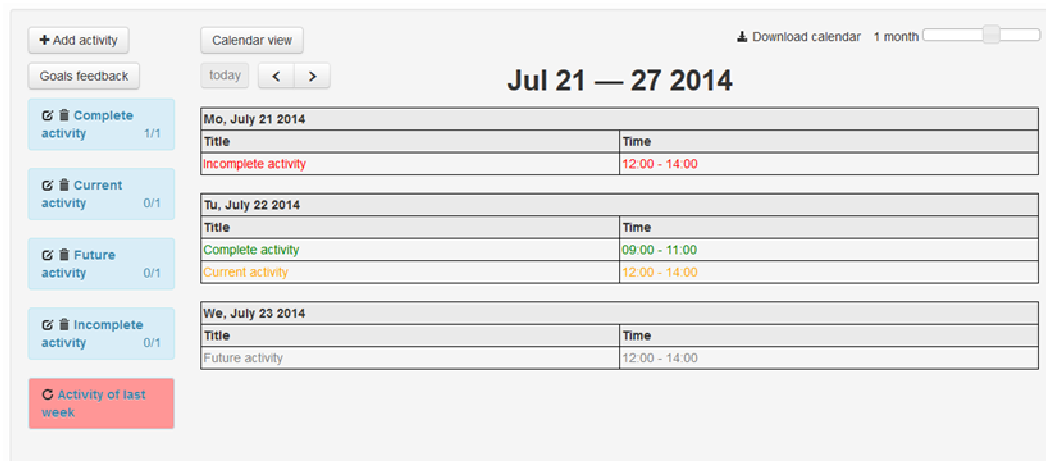


Figure 37: Calendar Application - Agenda View

Note: The Agenda view is useful when printing planned activities.

Lastly, the calendar events can be exported to external electronic calendars by selecting the “Download calendar” option (see Figure 34, clue 4). The timeframe for the export can be selected using the slider next to the export option (see Figure 34, clue 5). Consequently, an email is sent to the patient’s registered email address with an iCalendar formatted file for the period desired.

4.4.4 Review

The review aims at examining past activities and their recordings in order to evaluate the success and how successfully you have met your personal goals. The intention of the Review is three-fold

- (1) Checking whether all result data of the review time-range are complete (Step 1 and Step 2). If some data is still missing you are requested to complete them. These data is the basis for the feedback in the next steps.
- (2) Giving feedback on how successfully you have completed your activities and hence, how successfully you have met your goals (Step 3 and Step 5). Charts will give you additional visual feedback (Step 4).
- (3) Step 6 is a reminder to continue with planning and updating your activities for the next week.

4.4.4.1 Step 1 – Review past period (default: one Week)

The time range to review may be varied between 3 days and 3 years but refers typically to the past week (see Figure 38, clue 1). Furthermore, the review process is a guided wizard with several steps. It is always possible to repeat the previous step, if desired. At any step, some additional information to the current step may be requested (see Figure 38, clue 2). The distinct review steps are as follows:

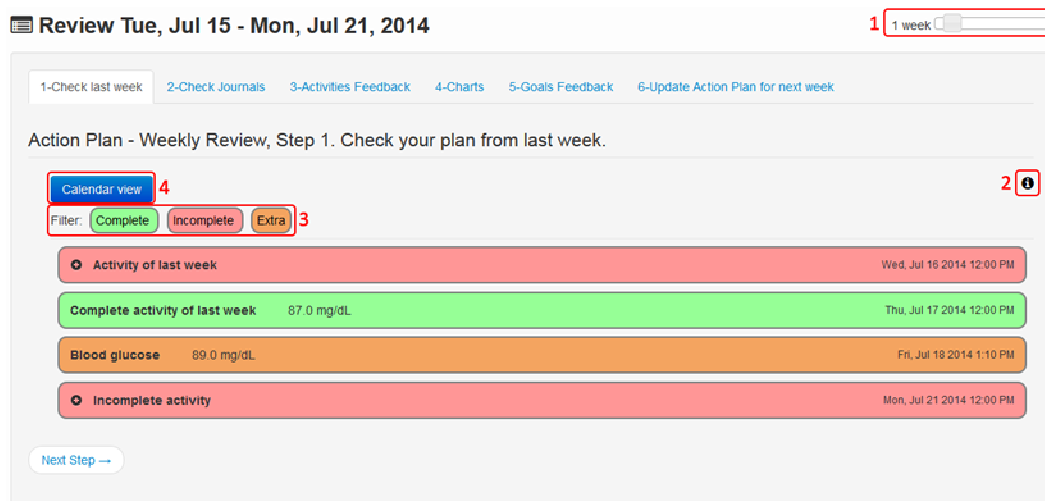


Figure 38: Review - Step 1, list view

The activities and recordings of the reviewed time range are displayed. The activities are coloured according to the following categories (see Figure 38, clue 3):

- Complete (green): Activities effectively performed.
- Incomplete (red): Activities planned, but not performed
- Extra (brown): Activities are not planned as demonstrated on section 4.4.3, but additionally performed and recorded (see section 4.8).

You may limit the list entries to selected categories by clicking on the category filters (see Figure 38, clue 3).

Activities marked as “Incomplete” may be completed by inserting the missing data using the corresponding add icons.

The activities of the past week may be also shown in a calendar (see Figure 39) by pressing the button “Calendar view” (see Figure 38, clue 4)

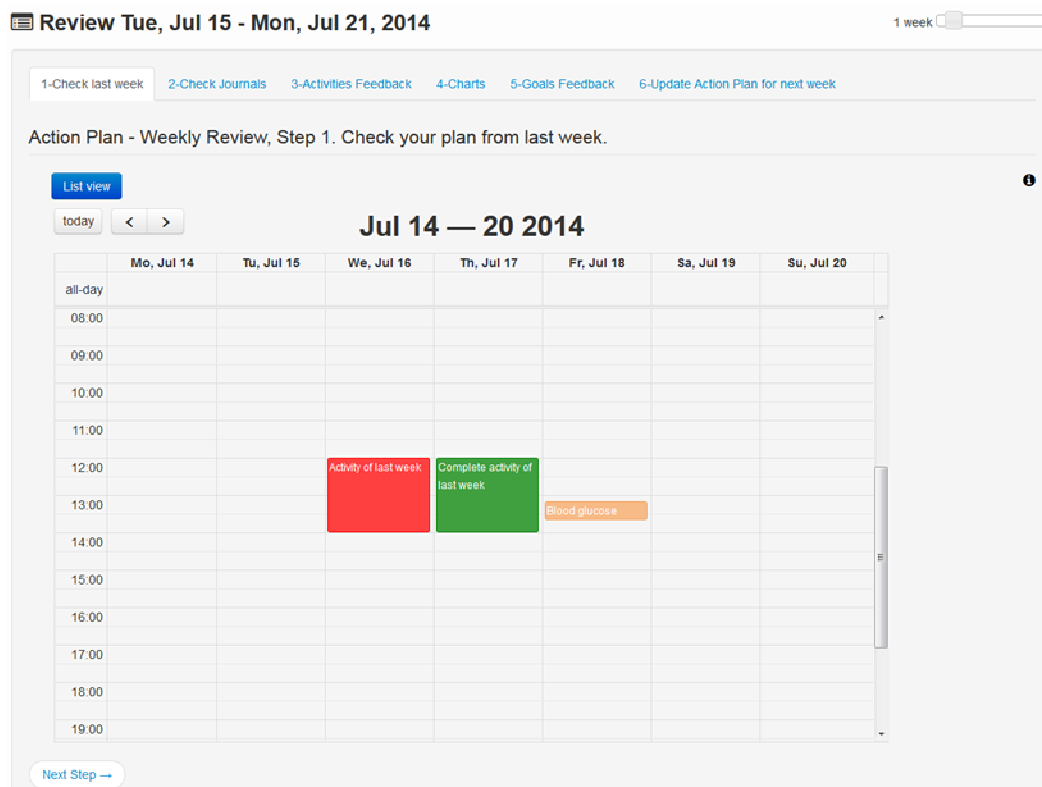


Figure 39: Review - Step1, calendar view

4.4.4.2 Step 2 – Check Journal Entries

The collected journal entries of the reviewed time range are shown, see chapter 4.8 for detailed explanations. Opposite to activities (e.g. jogging), journal entries are personal observations, recordings used to report the patient's progress to the medical care provider or for your personal needs.

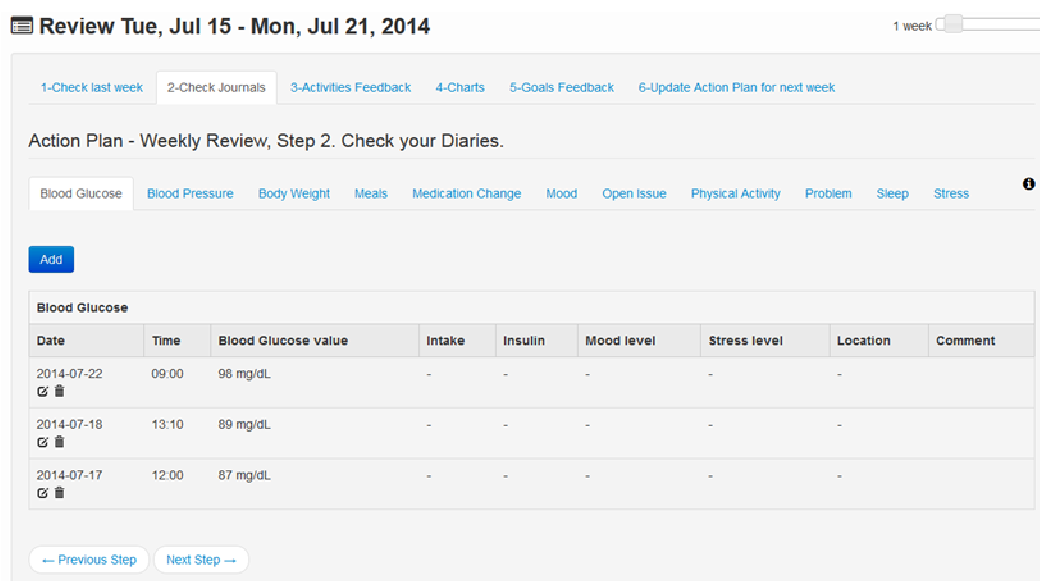


Figure 40: Review - Step 2

Note: The collected data is private by default. To grant access to the medical care provider, explicit consent of the patient is required (see chapter 4.10, "Consent Editor" for details).

As part of the review you should check whether you have recorded all necessary data of the review time range. If some data missing you can add them by clicking on the “Add” button or edit/delete data by choosing the corresponding edit/delete icons.

4.4.4.3 Step 3 – Activity Feedback

The system provides an overall feedback how successfully you have completed your planned activities within the time-range for the review. Figure 41, clue 1 indicates your overall performance based on all planned activities of the review time-range.

The column “Performance” (see Figure 41, clue 2, center) describes the performance in percent (e.g. 43%) and indicates the number of completed activities (e.g. “3/7” means 3 activities from 7 activities were completed). The column “Tips” (see Figure 41, clue 3, right) shows some additional improvement tips.

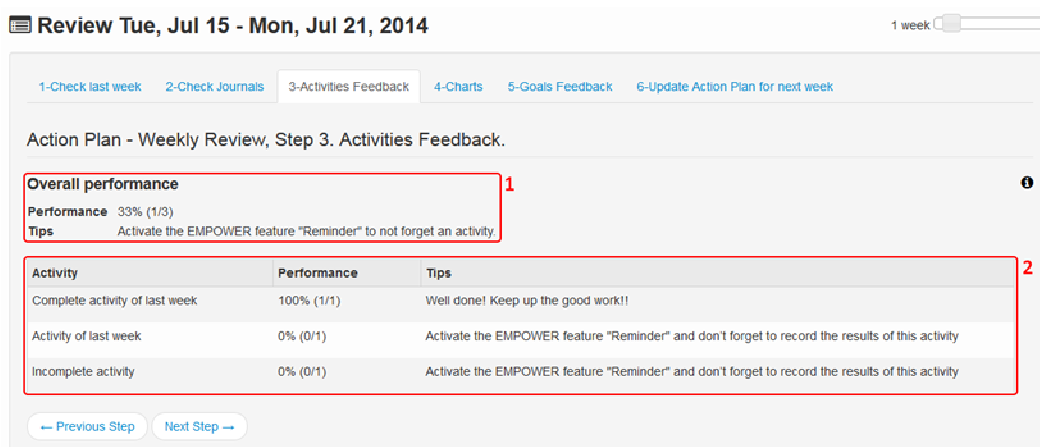


Figure 41: Review - Step 3

4.4.4.4 Step 4 – Charts

To get a quick overview of the personal progress, the recordings of blood pressure, blood glucose and weight are shown. Charts based on other data can be selected as described in section 4.5

Review Fri, Jul 4 - Thu, Jul 10, 2014

1 week
[1-Check last week](#)
[2-Check Journals](#)
[3-Activities Feedback](#)
[4-Charts](#)
[5-Goals Feedback](#)
[6-Update Action Plan for next week](#)

Action Plan - Weekly Review, Step 4. Charts.

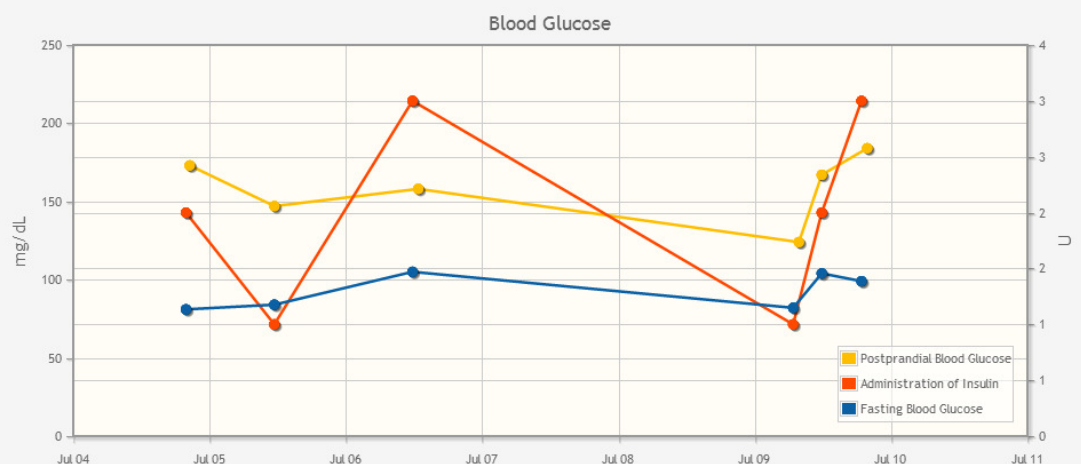
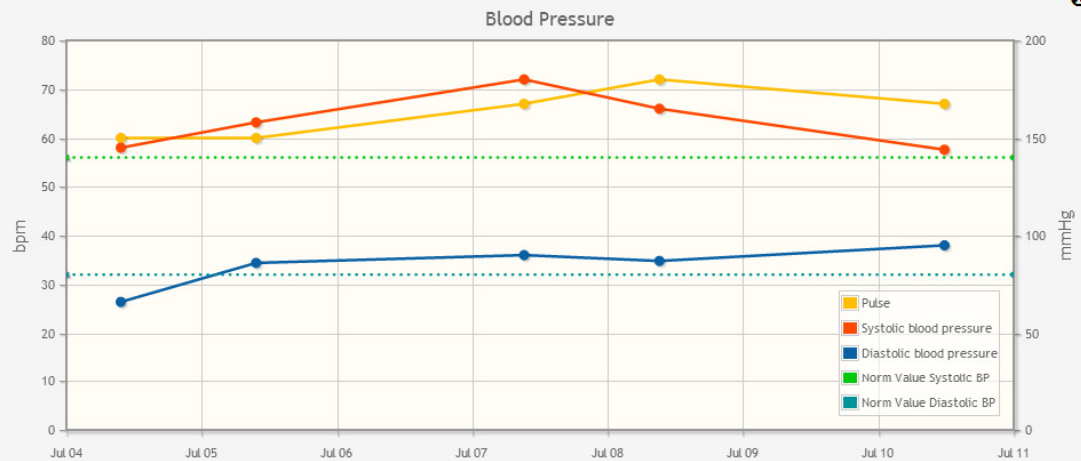


Figure 42: Review - Step 4

4.4.4.5 Step 5 – Goals Feedback

Typically, activities are associated to personal goals. This step (see Figure 43) presents you an overview how successfully you have met your goals with the activities of the review time-range. A goal can be related to one or several activities.

The column “Performance” describes the performance in percent (e.g. 43%) and indicates the number of completed activities that are related to the associated goal (e.g. “3/7” means 3 from 7 activities have contributed to the associated goal). The column “Tips” shows some additional improvement tips.

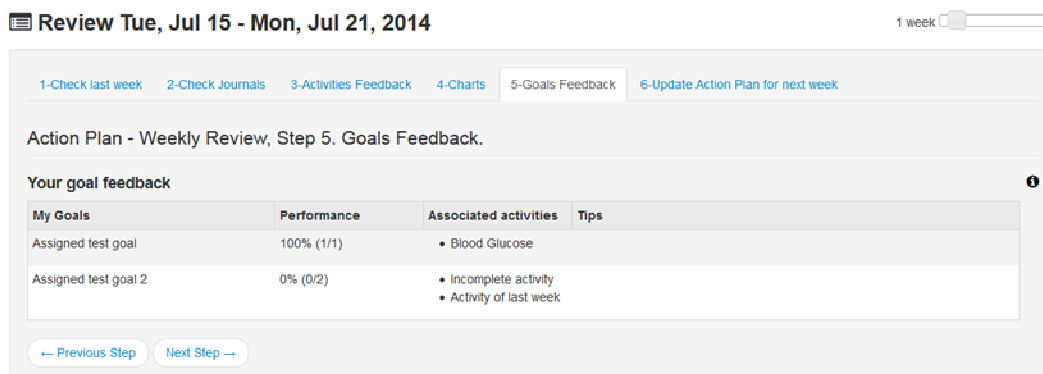


Figure 43: Review - Step 5

4.4.4.6 Step 6 – Update Action Plan for next week

To finalize the review process, the user may plan his or her activities for the upcoming week.

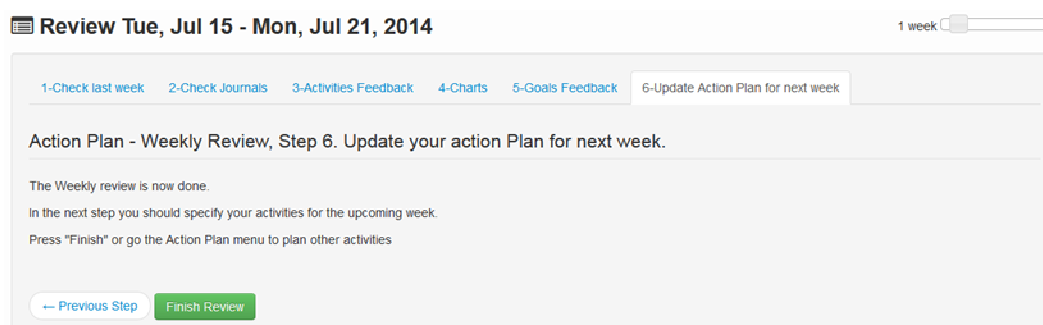


Figure 44: Review - Step 6

Note: It is possible that based on the feedback you realise that a goal is too ambitious (e.g. performing some sport activities five times a week). In such cases you can e.g. break down your goal into smaller steps, in a way you can reach it. In case of medical goals, please contact your treating physician.

4.5 Charts

Different types of charts support the visualisation of the recorded observations and the evaluation of personal improvement respectively. To display a diagram, it is required to

1. select the chart menu item
2. choose the type of diagram (see Figure 45, clue 1) and
3. optionally specify the time range and end date (see Figure 45, clue 2).

Charts and Trends

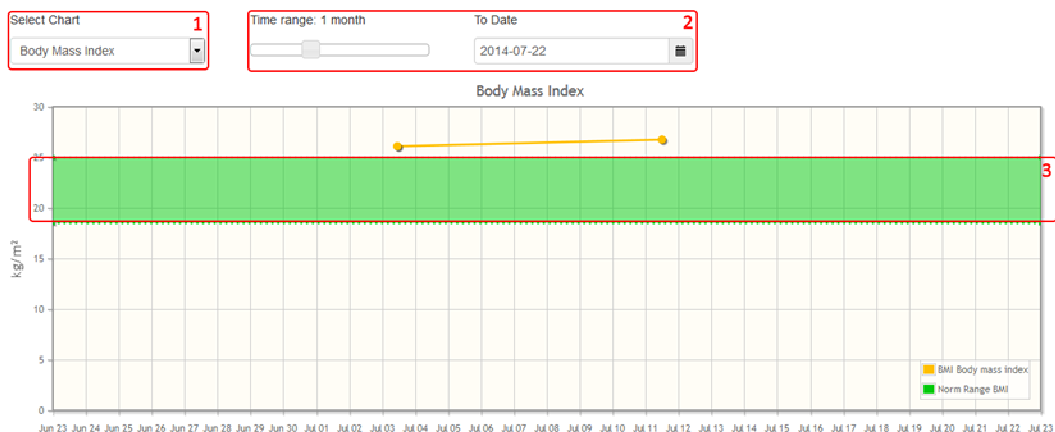


Figure 45: User Interface for Selecting a Chart and Adapting its Timeframe

Note: The more data is recorded, the more significance is provided by the diagrams. Blood Glucose, Blood Pressure and Body Mass Index charts are indicating target ranges/values (see Figure 45, clue 3) as provided in the user settings. Measurement results are drawn as lines whereas mental parameter and physical activity recordings are drawn as bars within the diagrams (see Figure 45 and Figure 47).

Charts and Trends

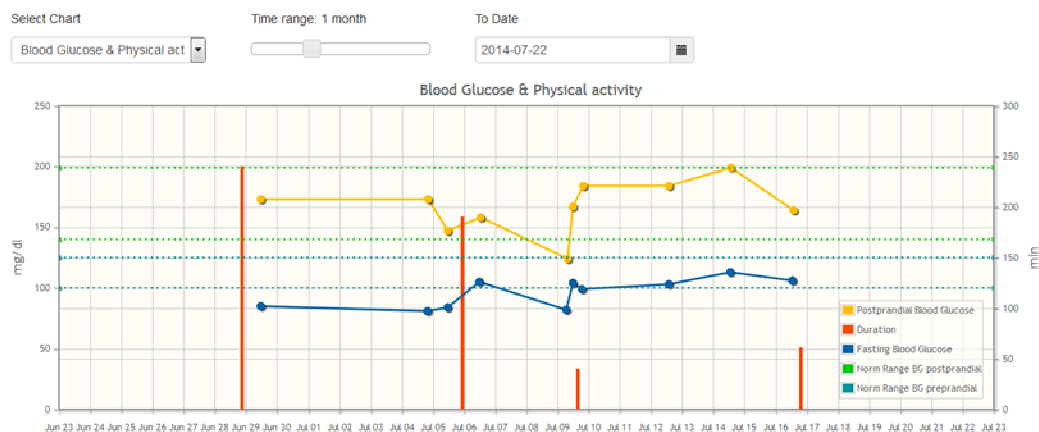


Figure 46: Chart showing Blood Glucose and Duration of Physical Activities in one plot for one month

The Blood Glucose and Physical Activities diagram depicts the recorded blood glucose values in combination with the recorded Duration of physical activities. This may give valuable feedback to the patients regarding the effects that physical activities may have on their blood glucose levels.

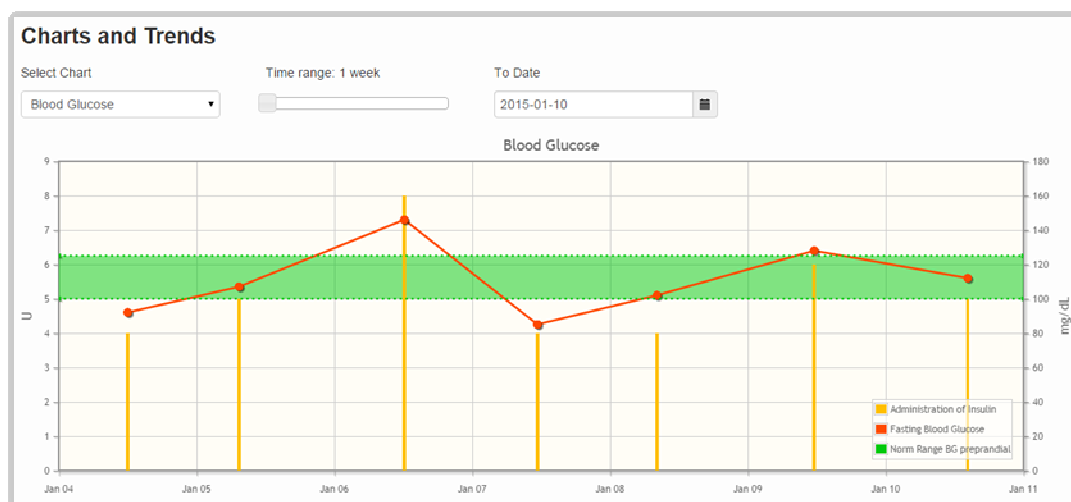


Figure 46: Chart showing Insulin Administration and Blood Glucose in one plot for one week

The Blood Glucose diagram is showing the recorded insuling doses as well. This combined presentation, that in addition shows the target range for the blood glucose level, gives a comprehensive overview on the actual situation as well as on existing trends regarding the recorded blood glucose and insulin values.

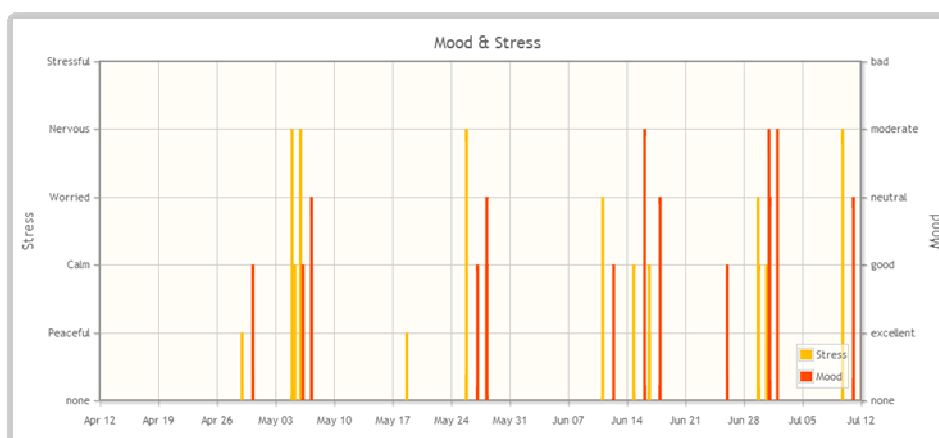


Figure 47: Chart showing mental parameters Mood and Stress for one month

The Mood and Stress diagram depicts the recorded values for both mental parameters in one plot. The graphical visualization of the mood and stress levels can help to recognize patterns in time or to detect particular situations that influence wellbeing.

4.6 Add new data

The main menu item “Add” allows adding new activities, goals or other observations quickly. Many of the provided functions are also available at other menu items (e.g. Action Plan). However, below the “Add” menu item, they are co-located together.

4.6.1 Goals

Adding new goals starts a guided wizard with two steps. First, the medical care provider’s recommendations are displayed, than you can specify a new personal goal.

4.6.1.1 Step 1 – Select recommendations

Step 1 presents an overview of all recommendations specified by one of your medical care providers or by you. For specifying a new goal you should associate this activity to one or more of these recommendations. You may choose all recommendations (see Figure 48, clue 1) or choose just one or several distinct recommendations as shown in Figure 48, clue 2.

Please specify your personal self-management goals:

1. Select Recommendations 2. My Goal

Try to choose at least one new treatment goal that you might enjoy doing. This can be even small things such as going for walk twice a week. ⓘ

My recommendations for self-management from my doctor(s)

<input type="checkbox"/>	Date	Care Provider	Recommendation
<input type="checkbox"/>	02/08/2012	Hans Schmidt	Take the medications every morning.
<input type="checkbox"/>	02/08/2012	Hans Schmidt	Measure and record blood sugar and blood pressure daily.
<input type="checkbox"/>	02/08/2012	Hans Schmidt	Check your weight on Sunday morning before breakfast.
<input type="checkbox"/>	02/08/2012	Hans Schmidt	Change your eating behaviour within the next two months.
<input type="checkbox"/>	02/08/2012	Hans Schmidt	Do some sports.
<input type="checkbox"/>	02/08/2012	Hans Schmidt	Lose 5 kg.
<input type="checkbox"/>	07/21/2014	Myself	Drink less coffee (Added by Manfred Maier)

Figure 48: Add goal - Step 1

Note: The assignment of goals to recommendations reminds you why you specified a specific goal and establish a connection to the recommendations specified with your doctor at a past consultation. Hence, if possible assign recommendations to your goals

4.6.1.2 Step 2 – My goal

In the next step, you can specify a new goal by indicating a goal title (“specify a goal”) and a description of the goal (“goal description”) (see Figure 49, clue 1). Goals are sometimes challenging and often needs some overcoming and discipline to be achieved. Hence, you should also think of how you would keep your motivation and how you would reward yourself when you have reached the goal (see Figure 49, clue 2).

Please specify your personal self-management goals:

1. Select Recommendations 2. My Goal

Specify a goal

Goal Description

Describe any rewards or motivations that might help you achieve your goal:

Comments

← Previous Step **Save Goal**

Figure 49: Add goal - Step 2

To complete the specification for a new goal press the button “Save goal” (see Figure 49, clue 3). Whenever a goal is stored, it is immediately shown in the list of available/current goals and it is possible to plan activities for this goal (see section 4.4.2)

Note: Sometimes it might be difficult for you to specify a convenient personal goal or realistic activities for a week. In this cases it could be useful to you looking at the EMPOWER Tips

(see Figure 49, clue 4). They might give you some ideas how to cope with the current step (see Figure 50).

Tips

If it is difficult for you, look for options or alternatives.

- you can share your goals with the family, friends, health professionals or use the Internet or
- you could break down a goal in smaller sub-goals with a higher likelihood to be achieved.

And most importantly, think about HOW you are going to reward yourself for reaching the goal. What about going to the movies on Saturday or sleeping in an extra hour on Saturday?

Imagine and describe the benefits of reaching your treatment goals and what other benefits you want to receive.

Try to find partners who would like to reach the same goals. Look in your close surroundings. Is there any friend who would like to go for regular walks with you?

Share your success with other people. Tell your doctor, friends or family about the activities that you are doing.

Figure 50: EMPOWER Tip (example)

4.6.2 Activity

Adding new activities starts a guided wizard with several steps. First, you choose one or more goals to be associated to the new activity. Next, you describe the activity (Step 2) and plan it with a calendar (Step 3). In Step 4 you can continue with planning further activities or you can finalize your weekly planning.

4.6.2.1 Step 1 – Associate goals

Step 1 presents an overview of all your personal goals. The colour coding implies the planning status for the current week (green: activities are linked to this goal in the current week, red: no activities are linked to this goal in the current week). For planning a new activity you should associate this activity to one or more of your personal goals. You may choose all your goals (see Figure 51, clue 1) or choose just one or several distinct goals as shown in Figure 48, clue 2.

1. Associate Goals

2. Activity

3. Plan it

4. Review

Which personal goals are relevant to your activity?

<input type="checkbox"/> Date	My Goals
<input type="checkbox"/> 07/15/2014	Meditation
<input type="checkbox"/> 07/22/2014	Marathon

Figure 51: Add activity - Step 1

Note: The assignment of activities to goals is crucial for the weekly review. The successful achievement of goals is linked to the execution of the planned activities. It also reminds you of the reason why you perform an activity. Hence, if possible assign a goal to your activities.

4.6.2.2 Step 2 – Activity

You specify the activity in more details starting with indicating an activity category (see Figure 52, clue 1). Depending on the activity category some more information might be required, in particular the type of vital sign for the category “Vital signs”, the type of meal for the category “Nutrition”, the type of physical activity for the category “Physical Activities”.

Next, you add a title for the activity (see Figure 52, clue 2) and if meaningful you can add a more detailed description (see Figure 52, clue 3).

Figure 52: Add activity - Step 2

4.6.2.3 Step 3 – Plan it

In Step 3, you plan the point of time and the duration of the new activity based on a calendar view. Activities are created by clicking into the calendar (add calendar item) and dragging the calendar item (specify time range) as shown in Figure 53, clue 1. Alternatively, it is possible to check the weekdays and specify the start and end time (Figure 53, clue 2). This is useful for recurring activities. To plan recurring activities for a longer period of time, specify the end date in the separate field by using a calendar (Figure 53, clue 3).

Note: if you change recurring activities (e.g. the duration) this will apply to all activities of this type.

You can also specify reminders (Figure 53, clue 4) by clicking on the Button “Reminder”. Reminders are sent to the inbox (see section 4.2) and additionally via E-mail in case the corresponding checkbox is selected. The time span for the reminder varies between 5 minutes and one week.

Note: By using the edit and delete symbols (Figure 53, clue 5), it is possible to adjust the settings for an activity or to remove it entirely.

To complete your planning and save the new activity press the button “Save and review” (Figure 53, clue 6).

Basketball

1. Associate Goals 2. Activity 3. Plan it 4. Review

Reminder
☒ E-mail
 Time before reminder: 10 minutes

Current Schedule:

Tu 08:00 - 09:00 5

Sa 12:00 - 14:00 2

Weekdays: Mo Tu We Th Fr Sa Su

Begin: 12:00

End: 14:00

Carry on until: 3

today < >

Jul 21 — 27 2014

	Mo, Jul 21	Tu, Jul 22	We, Jul 23	Th, Jul 24	Fr, Jul 25	Sa, Jul 26	Su, Jul 27
all-day							
07:00							
08:00		Basketball					
09:00							
10:00							
11:00							
12:00						Basketball	
13:00							
14:00							
15:00							
16:00							
17:00							
18:00							

← Previous Step Save and review 6

Figure 53: Add activity - Step 3

4.6.2.4 Step 4 – Review

The final step of the activity gives you an overview of the already planned activities of the current week (see Figure 54, clue 1) and an overview of goals without activities in the current week (see Figure 54, clue 2)

1. Associate Goals 2. Activity 3. Plan it 4. Review

Planned activities in this week 1

- ✓ Basketball
- ✓ Have fun!
- ✓ Measure BP

Goals without an activity in this week 2

- Lose 1 kg per week
- Limit coffee twice per day

Plan another activity Finish planning

Figure 54: Add activity - Step 4

If you want to add further activities for the current week press the button “Plan another activity”. If you have already finished the planning press the button “Finish planning”.

4.7 Add Problem, Vital Signs, Physical Activity, Meals

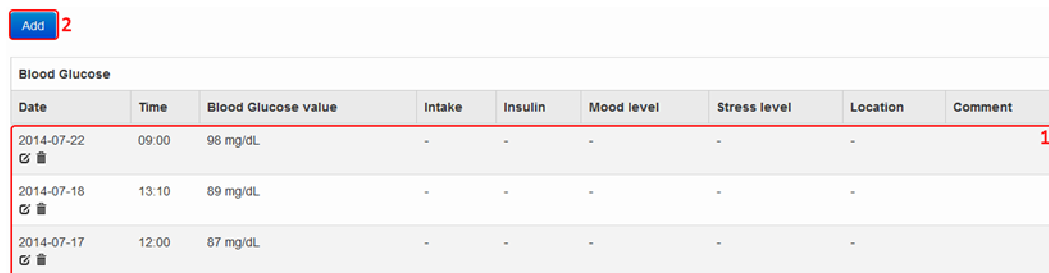
The menu points in the “Add” main menu correspond to the equally named items in the Journal main menu – see section 4.8 for details.

4.8 Journal

The journal menu item contains sub-menu items for recording and collecting observation and patient data relevant for diabetes patients. In detail the following items can be collected by web forms:

- Blood glucose
- Blood pressure
- Body weight
- Meals
- Medication changes
- Mood
- Open issues
- Physical activities
- Problem
- Sleep
- Stress

By choosing a category (e.g. Blood Glucose) the system lists all the stored entries of this particular journal category (see Figure 55, clue 1). It is also possible to add a new journal entry by clicking on the “Add” button (see Figure 55, clue 2). Any of the listed journal entries may also be edited/deleted by choosing the corresponding edit/delete icons.



Blood Glucose								
Date	Time	Blood Glucose value	Intake	Insulin	Mood level	Stress level	Location	Comment
2014-07-22	09:00	98 mg/dL	-	-	-	-	-	
2014-07-18	13:10	89 mg/dL	-	-	-	-	-	
2014-07-17	12:00	87 mg/dL	-	-	-	-	-	

Figure 55: Journal - Glucose

Adding new journal entries is performed in a separate form that provides relevant input fields. Some of the input fields are optional, some mandatory. The latter are marked with a star (see Figure 56, clue 1). Whenever all mandatory fields are provided, it is possible to store the journal entry (see Figure 56, clue 2).

Blood Glucose

Date * 2014-07-22 15:12

Blood Glucose Level * ... mg/dL

When

Show insulin data ☒

Location

- ☐ at home
- ☐ at work
- ☐ at a party
- ☐ travelling
- ☐ on vacation
- ☐ dining out
- ☐ other

Mood level

2 Fill in all required fields and click Save OK Cancel

Figure 56: Journal Entry Form - Glucose

4.8.1 Add Blood Glucose

Please insert date/time and blood glucose level as mandatory data. Optional data are associated meals ("When", e.g. after breakfast, before lunch), the location (e.g. at home), the mood level, the stress level and comment.

Blood Glucose

Date * 2014-01-01 12:00

Blood Glucose Level * 111 mg/dL

When after breakfast

Show insulin data ☒

Location

- ☒ at home
- ☐ at work
- ☐ at a party
- ☐ travelling
- ☐ on vacation
- ☐ dining out
- ☐ other

Mood level

OK Cancel

Figure 57: Blood glucose - edit form

If you are on insulin you can also insert the insulin dosage (calculated as Insulin Units IU), the insulin type (e.g. short-acting, rapid-acting) and the insulin intake (e.g. intravenous, oral) as shown in Figure 58.

Hide insulin data ^

Insulin dose

Insulin type

Insulin intake

Figure 58: Blood glucose - edit insulin data

4.8.2 Add Blood Pressure

Please insert date/time, systolic and diastolic values and the pulse as mandatory data. Optional data are the mood level, the stress level and comment.

Blood Pressure x

Date *

Systolic *

Diastolic *

Pulse *

Mood level ☐ ☒ ☐ ☐ ☐

Stress level

Comment

Figure 59: Blood pressure - edit form

4.8.3 Add Body Weight

Please insert date/time, weight, height and state of dress as mandatory data. Note: the height can be pre-specified as part of the settings (see section 4.3). Based on weight and height the Body Mass Index (BMI) will be calculated.

Optional data are the mood level, the stress level and comment.

Figure 60: Body weight - edit form

4.8.4 Add Meals

Please insert date/time, type of meal (e.g. breakfast, lunch) and the food items as mandatory data.

Food items may be added using “Predefined meals” (see Figure 61, clue 1) or “Food items” (see Figure 61, clue 2) and are listed in a table (see Figure 61, clue 3). The description of a food item consists of three parts and you can insert both a high level description as well as a detailed description, e.g.:

1. amount:	1	20
2. unit:	slice	g
3. description:	bread	butter

Predefined meals may be added in the settings (see section 4.3). The ingredients can be added to the food item table by selecting a meal and clicking on the corresponding “Add” button.

For inserting additional food items define the amount, unit and description and click on the corresponding “Add” button. The button is only clickable when amount, unit and description are defined.

Optional data are the mood level, the stress level and comment.

Meals

Date * 2014-01-01 09:00

Type of Meal * Breakfast

1 Predefined meals Select meal Add

2 Food Items amount - unit - e.g. fried egg, white bread Add

3

bread	1 slice(s)	x
butter	20 g	x

OK Cancel

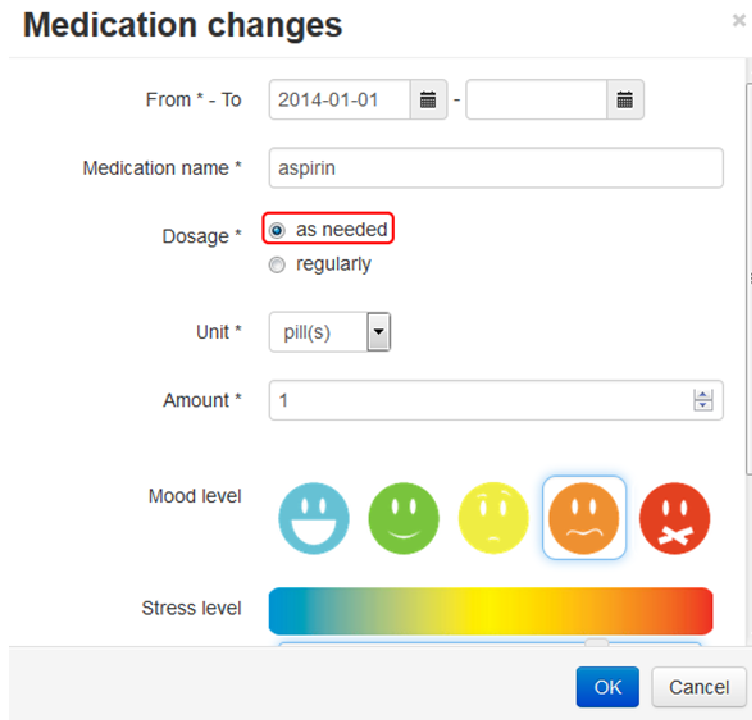
Figure 61: Meals - edit form

4.8.5 Add Medication Changes

Please insert date, medication name and dosage as mandatory data. If you start with a medication or you want to insert a medication change please use the start date (“from”). If you finish a medication please indicate the end date (“to”).

In case of an occasional or singular medication please choose “as needed” for dosage (see Figure 62) and indicate the unit (e.g. pill, drops, mg) and the amount of the medication (e.g. “1” for “1 pill”). In case of a permanent medication please choose “regularly” for dosage (see Figure 62) and indicate the unit and the amount in association of the time of intake (in the morning, at noon, in the evening, at night).

Optional data are the mood level, the stress level and comment.



Medication changes


From * - To 2014-01-01 -


Medication name * aspirin

Dosage * ☒ as needed
☐ regularly

Unit * pill(s)

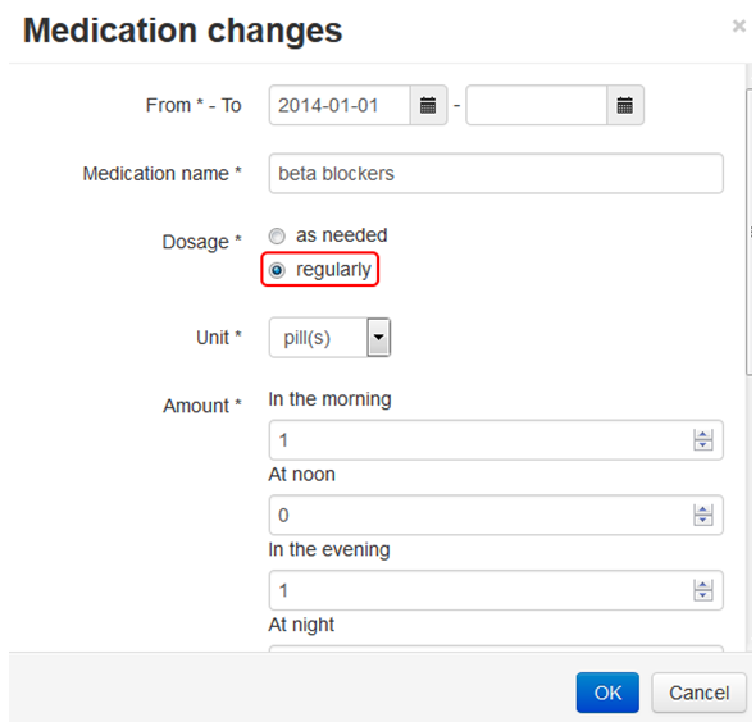
Amount * 1

Mood level 

Stress level 

OK Cancel

Figure 62: Medication changes, as needed- edit form



Medication changes

From * - To 2014-01-01 -

Medication name * beta blockers

Dosage * ☐ as needed
☒ regularly

Unit * pill(s)

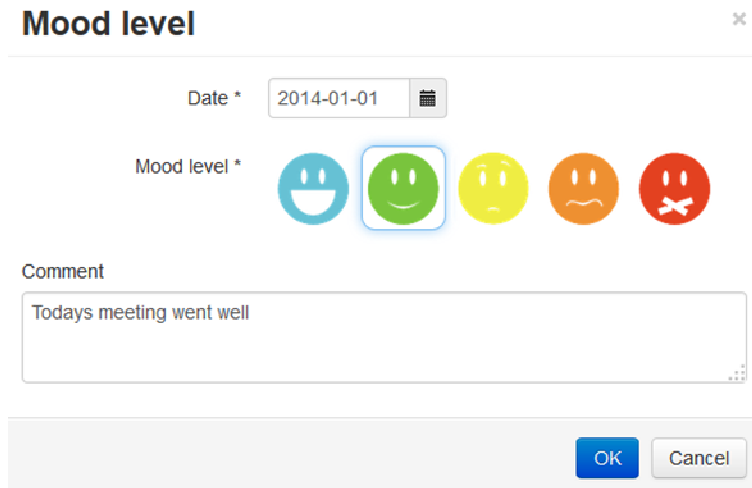
Amount * In the morning
1
At noon
0
In the evening
1
At night

OK Cancel


Figure 63: Medication changes, regularly - edit form






4.8.6 Add Mood

Please insert date and your perceived mood level as mandatory data. Comment is an optional entry.



Mood level ✕

Date * 2014-01-01 

Mood level *     

Comment

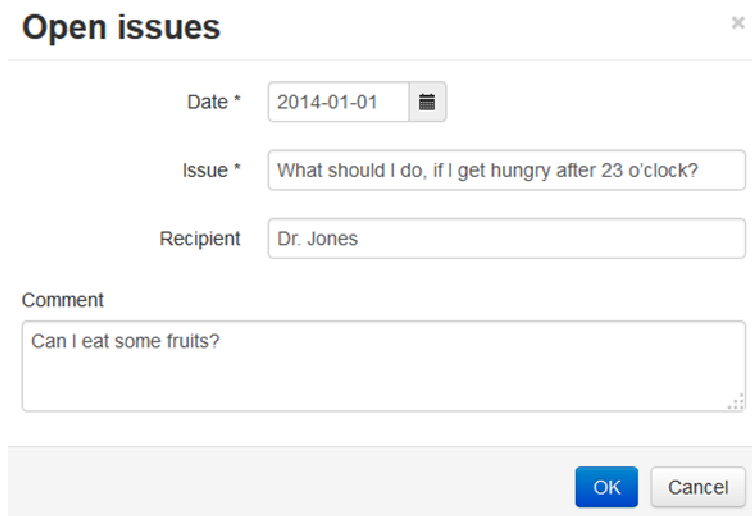
Today's meeting went well

Figure 64: Mood - edit form


4.8.7 Add Open Issues

Please insert date and the topic for the open issue as mandatory data. Optional data are the recipient and comments.

For example you can insert a question for your doctor at the next consultation.



Open issues ✕

Date * 2014-01-01 

Issue * What should I do, if I get hungry after 23 o'clock?

Recipient Dr. Jones

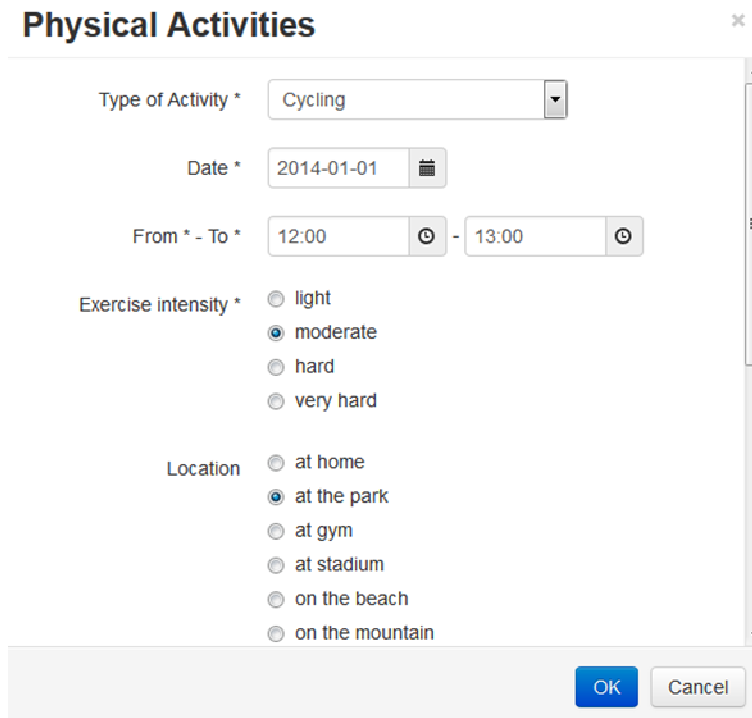
Comment

Can I eat some fruits?

Figure 65: Open issues - edit form

4.8.8 Add Physical Activity

Please insert date/time, type of activity and exercise intensity as mandatory data. Optional data are location, mood level, stress level and comment.



Physical Activities

Type of Activity *

Date *

From * - To * -

Exercise intensity * ☐ light
☒ moderate
☐ hard
☐ very hard

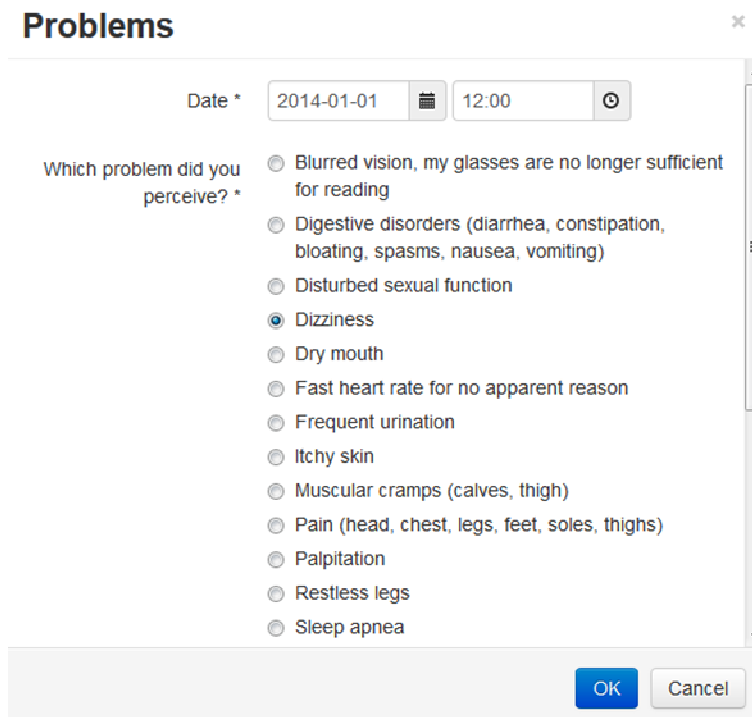
Location ☐ at home
☒ at the park
☐ at gym
☐ at stadium
☐ on the beach
☐ on the mountain

OK Cancel

Figure 66: Physical activity - edit form

4.8.9 Add Problem

Please insert date/time and choose one problem item from the list as mandatory entries. Comment is optional and can be used for describing the problem in more details.



Problems

Date *

Which problem did you perceive? *

- ☐ Blurred vision, my glasses are no longer sufficient for reading
- ☐ Digestive disorders (diarrhea, constipation, bloating, spasms, nausea, vomiting)
- ☐ Disturbed sexual function
- ☒ Dizziness
- ☐ Dry mouth
- ☐ Fast heart rate for no apparent reason
- ☐ Frequent urination
- ☐ Itchy skin
- ☐ Muscular cramps (calves, thigh)
- ☐ Pain (head, chest, legs, feet, soles, thighs)
- ☐ Palpitation
- ☐ Restless legs
- ☐ Sleep apnea

OK Cancel

Figure 67: Problem - edit form

4.8.10 Add Sleep

Please insert date/time and sleep quality as mandatory data. Optional data are one or several sleep symptoms, the mood level, the stress level and comment.

Note: you can use to describe your sleep problems either by selecting sleep symptoms or by describing your problem as a comment.

Figure 68: Sleep - edit form

4.8.11 Add Stress

Please insert date and your perceived stress level as mandatory data. Comment is an optional entry.

Figure 69: Stress - edit form

4.9 Info

The info menu provides further information pertaining information material, forums and your patient data from appointments with your doctor (Diabetes Passport). You are strongly encouraged to read the information material carefully in order to gain knowledge about diabetes and the challenges when facing diabetes. Also the forums listed enables communication between other people facing diabetes. Lastly, bookmarks reference additional material that might be of interest; these are created by the medial staff and other patients

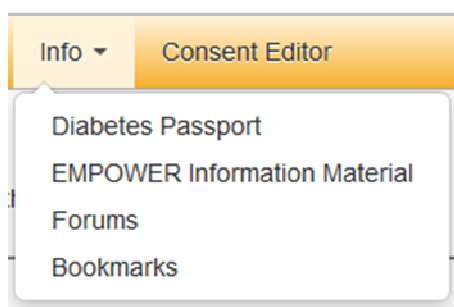


Figure 70: Info Menu

4.9.1 Diabetes Passport

The Diabetes Passport provides an overview about your patient data recorded at a consultation with your doctor. When you choose the date of the consultation list (see Figure 71, clue 1) the available patient data of this consultation will be displayed:

- Lab results
- Medication summary including the dosage
- Current problems

Diabetes Passport

 1

Lab results

Measurement	Value
creatinine	0.79
High Density Lipo Protein	31
HbA1c	7.4
Height	185.0
Weight	109.0
Diastolic blood pressure	95
Systolic blood pressure	160
Low Density Lipo Protein	27.0
Spot Blood Glucose	330.0
Postprandial Blood Glucose	230.0
Fasting Blood Glucose	130.0

Medication summary

Medication name	Dosage (morning-noon-evening)
Ramipril HEXAL comp 2,5mg/12,5mg 100 Tbl. N3	1-0-0
Simvastatin Actavis 40mg 50 Filmtbl. N2	0-0-1
ASS-ratiopharm 100mg TAH 100 Tbl. N3	0-1-0
Carvedilol AAA 12,5mg 50 Filmtbl. N2	1-0-0
Metformin HEXAL 500mg 2x90 Filmtbl. N3	0-0-2
Sitagliptin	1-0-0

Active problems

Create date	Problem name
07/08/2014	Respiratory_insufficiency
06/30/2014	Congestive Heart Failure
06/30/2014	Hypertension

Figure 71: Diabetes Passport

4.9.2 EMPOWER Information Material

When you choose the Info materials option in the Info Menu (Figure 70) you will be redirected to the public EMPOWER information site⁴. Here you may find answers to many questions ranging from what is diabetes to useful tips on how to manage diabetes in the day to day business.

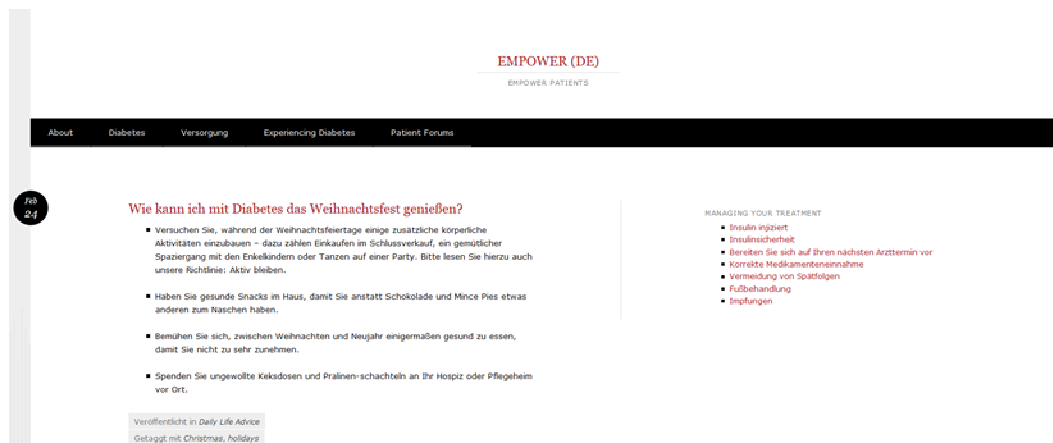


Figure 72: EMPOWER Information Material

The information material comprises the following categories

- **About** – represents the homepage of the information material. It also includes a tag cloud comprises the most used tags for a quick link to related articles
- **Diabetes** – comprises general information about diabetes, treatments and measurements
- **Management** – comprises information about nutrition and exercises
- **Experiencing Diabetes** – includes articles about how to manage your emotions, about the daily life with diabetes, how to deal with signs of troubles and what to do in case of being sick with diabetes
- **Patient Forums**—offers you access to established public patient's forums (see 4.9.3)

4.9.3 Forum

This menu item offers you access to established public patient's forums for you to communicate with other diabetic patients. Currently, patient forums in English, German and Turkish are offered.

⁴ hosted at <http://empowerpatient.wordpress.com/>

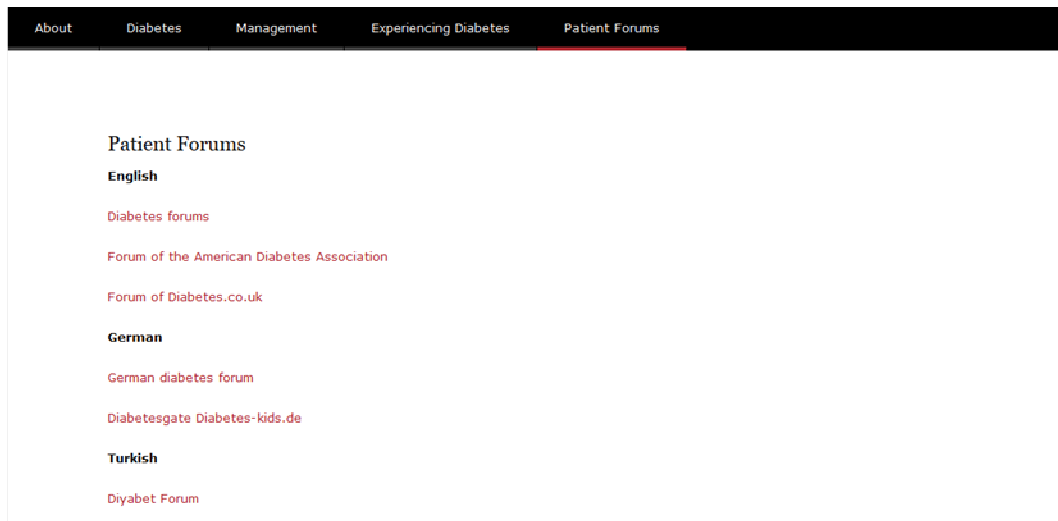


Figure 73: Patient forums

4.9.4 Bookmarks

Bookmarks are references to information materials found on the internet. Bookmarks can be created by you, other patients, and medical staff. These are shared within a public online EMPOWER bookmarking group.. The following sections will describe how to view or create and share bookmarks in the bookmarking group.

How do you view bookmarks for information material lists?

Open the EMPOWER Info material menu option, Figure 74, and select the bookmarks option. A new browser tab will open and a list of bookmarks will be displayed Figure 75.

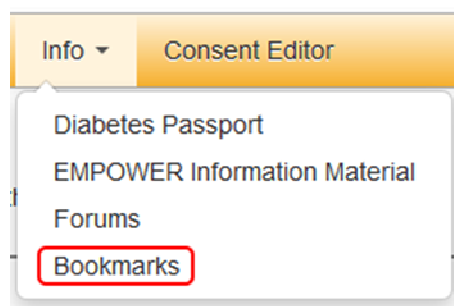


Figure 74 - Opening the bookmark list from the patient portal

If you wish to add your own bookmarks, please apply to join the group, Figure 75 (clue 1). Your clinical administrator might already have invited you by mail. The bookmarks (clue 2) are tagged (clue 3) using a simple dictionary to help organize and find bookmarks later. Filter and browse the bookmarks by selecting the tags in clue 4.

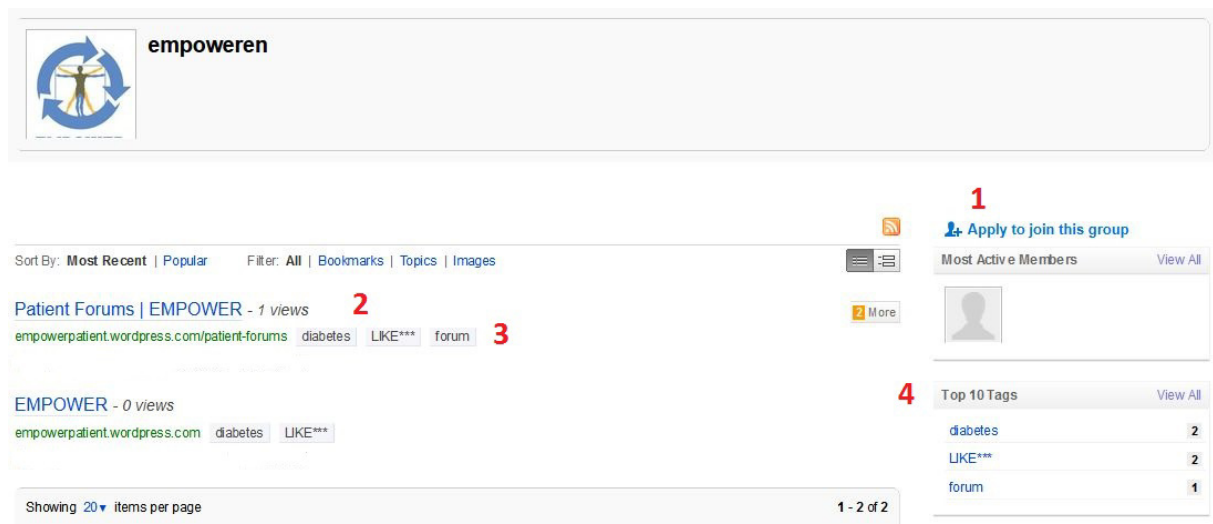


Figure 75 - The bookmarks list and how to join the group

In Figure 76 , the filtered bookmarks are displayed. The selected tag is shown in clue 1. Select (+) to add or select (-) to remove a tag from search filter



Figure 76 – Filter and browse the bookmarks by selecting the tags in clue 2. Clue 1 shows the current filter

How can you join the EMPOWER bookmarking group and create bookmarks for the group?

1. Join the bookmark group. At the listing of bookmarks, select the button for joining the group and you will be guided to create a user account. A moderator will add you later to the group. Alternatively, your moderator might invite you in advanced. Please ask about this at the workshop training.
2. Install a bookmarking tool for your browser <https://www.diigo.com/tools>.
 - For Web browsers: [Chrome](#)⁵, [IE](#)⁶, [Firefox](#)⁷.
 - In Smart phones it is possible to view or create bookmarks. Please the check tools section above or an app site for your Smart phone.

How can you create a bookmark for a web page?

⁵ Chrome <https://chrome.google.com/webstore/detail/diigo-web-collector-captu/oojbgadfejifecebmndnhhkbhdjaphole>

⁶IE - Internet Explorer <https://www.diigo.com/tools/toolbar?client=ie>

⁷ Firefox <https://www.diigo.com/tools/toolbar?client=ff>

1. Go to the page, open your bookmarking tool (Figure 77, clue 1) and click save! (clue 2)
2. Choose the EMPOWER group that you joined (Figure 78, clue 3).
3. Afterwards, the tag dictionary will automatically appear (Figure 79, clue 1). The title is automatic. Comments can be added if desired. Add tags from the displayed group dictionary to help organize the bookmarks. To help others, you can select tags to rate the information (LIKE, DIFFICULT)
4. Save the bookmark.

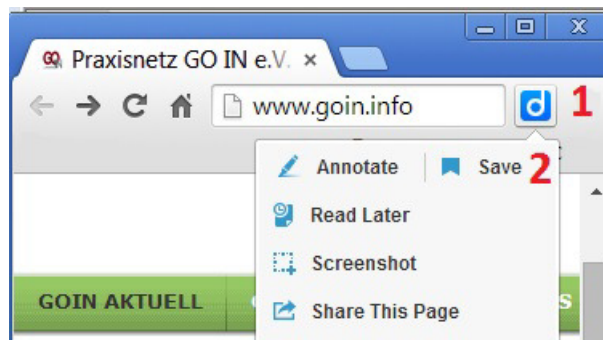


Figure 77 – Click on the Browser bookmark tool icon (Diingo) and SAVE

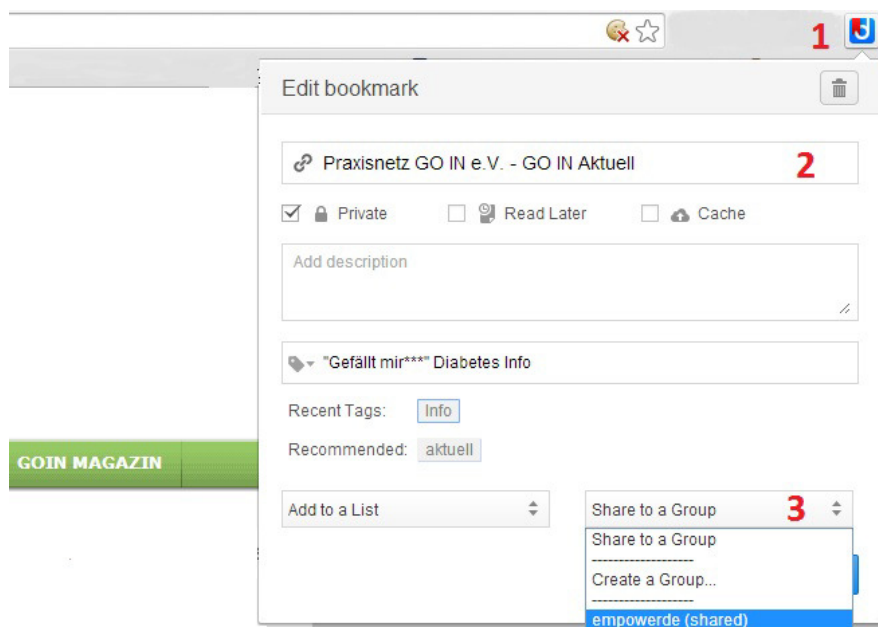


Figure 78 - Creating a bookmark, the title (clue2) is automatic. Select the group (clue 3) to share

Praxisnetz GO IN e.V. - GO IN Notfallpraxen

☒ Private ☐ Read Later ☐ Cache

Add description

Info

Recent Tags: Info

Recommended:

1 Group dictionary: Blutzucker Diabetes Foren Frage Gewicht Info

Insulin Mahlzeiten Medikamenten Problem Schlaf Sport

Stress Wohlbefinden Gefällt mir Gefällt mir*** Komplexität

Komplexität***

Add to a List empowerde (shared)

Save

Figure 79 - The group dictionary appears for the selected group

Are bookmarks removed at the end of the project?

The clinics should control their bookmarking group and decide with the patients how patients can access the bookmarks after project ends. The bookmarks are public and if nothing is done, they will continue to be available. The group bookmarks can also be downloaded for backup or reimported into another group.

4.10 Consent Editor

The Consent Editor allows the patient to control the visibility of his or her recordings to the medical care providers. The patient may control who (role based or individually) may access which kind of data.

The data managed by the EMPOWER patient portal can be split into the categories:

- Recommendations
- Journals
- Medication Journals
- (imported) Electronic Health Records

The data managed within the EMPOWER system is treated as private, thus invisible to everyone by default. Whenever the Consent Editor is invoked, the current list of consent items is displayed. The example shown in Figure 80 indicates that ALL care providers may access recommendations, journals and medication journals.

Patient: Manfred Maier

[XACML Dokument öffnen](#) 2

Consent Dokument:

Resources	Arzt	
	Erstellen	Read
Recommendations	Yes	Yes
Journals		Yes
Medication Journals		Yes
Gesundheitsdaten		

[Bearbeiten](#) 3

Figure 80: Consent Editor – Overview

In the above figure, description of the parts is as follows:

- Part 1: The current consent of the patient is presented in this tabular format. The empty cells means NO by default.
- Part 2: In this part the patients can download the XACML (eXtensible Access Control Markup Language) file showing their consents.
- Part 3: The patients can edit their current consents with this button.

When the patient gives explicit consent to others either by role or by explicitly naming the trusted care provider, access is granted to the concerned persons. When consent is given to a role (e.g. doctor), then all medical care providers of this particular role may access the data.

Patient: Manfred Maier

XACML Dokument öffnen

Bearbeiten Consent Dokument:

1 Subjekte

Rollen

Arzt

Person

Hans Schmidt (undefined)

2 Resources

☐ Recommendations

☐ Journals

☐ Medication Journals

☐ Gesundheitsdaten

3 Zugriffsrechte

Erstellen ☐ Erlauben ☐ Ablehnen

Read ☐ Erlauben ☐ Ablehnen

4

Consent Regeln :

Subjekt	Resource	Aktion	Zugriffsrecht	
Arzt	Recommendations	Read	Yes	<input type="button" value="X"/>
Arzt	Journals	Read	Yes	<input type="button" value="X"/>

5

Figure 81: Consent Editor - Modify Consent

In the above figure, description of the parts is as follows:

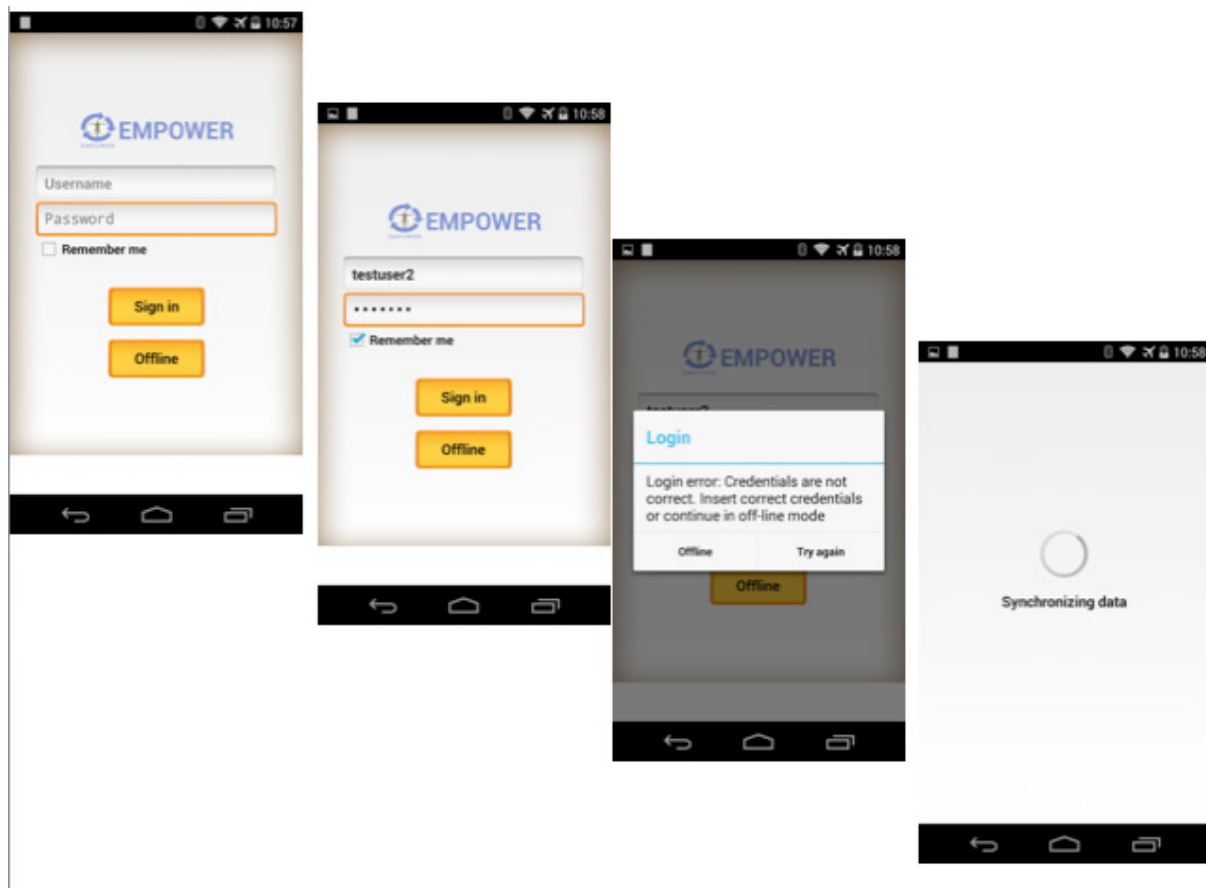
- Part 1: The patients can either give consent to a role or a specific person.
- Part 2: The resource types are shown in this part.
- Part 3: The rights are shown here.
- Part 4: The user can add the consent by clicking this button.
- Part 5: The user can delete a consent with this button.

Beside the web based EMPOWER patient portal, there is the possibility to record journal entries with the EMPOWER Mobile Application. The following sections gives an overview of the EMPOWER mobile application based on screenshots.

4.11 Mobile Application

4.11.1 Login Mobile Application

In order to use the mobile application, you have either to login (in order to let the application synchronize with the EMPOWER framework) or select to use it in offline mode. The credentials for login to the mobile application are identical to those for accessing the EMPOWER patient portal. The Offline mode is the only way of using the app in the absence of WiFi or mobile 3G-network connectivity. While using the app in Offline mode, the edited ODLs are stored locally, and whenever you log in and network connectivity is available, the local database is synchronized with the EMPOWER database. The user is given the option to store her credentials, by selecting the "Remember me" option. By this way, there is no need to re-enter the credentials whenever opening the application



4.11.2 Main Screen

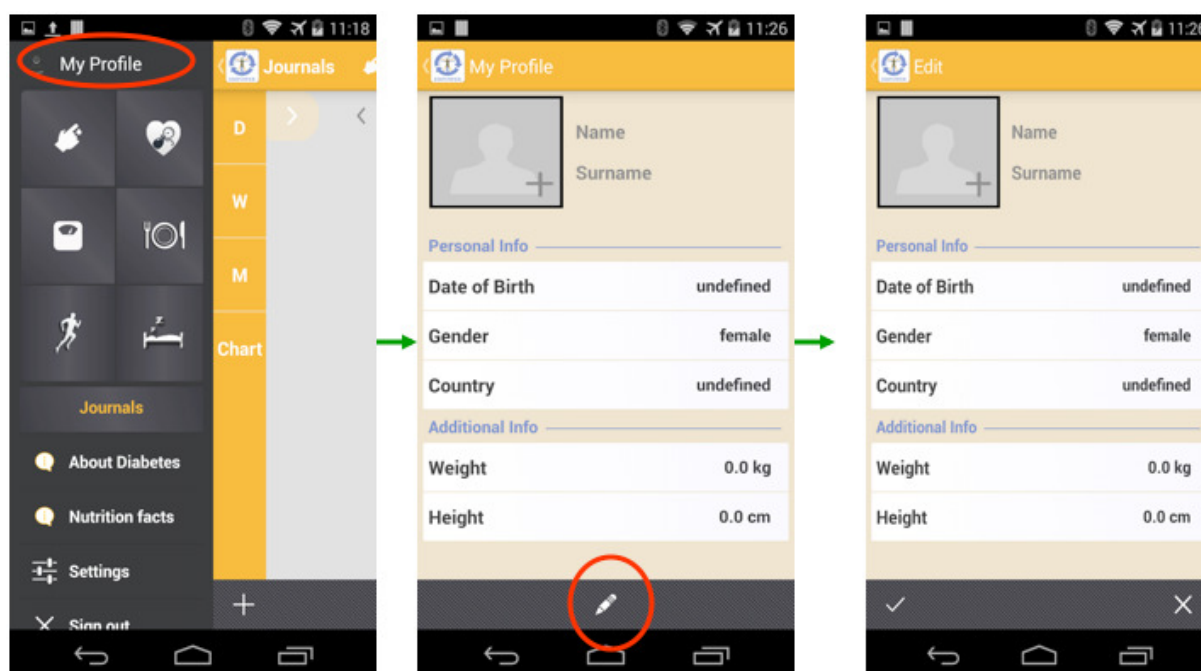
Upon successful login the EMPOWER mobile application's main screen is displayed. From the main screen the most important functions are directly accessible. As an example, the most often used functions for journal recordings (blood glucose, weight) are situated at the main screen.

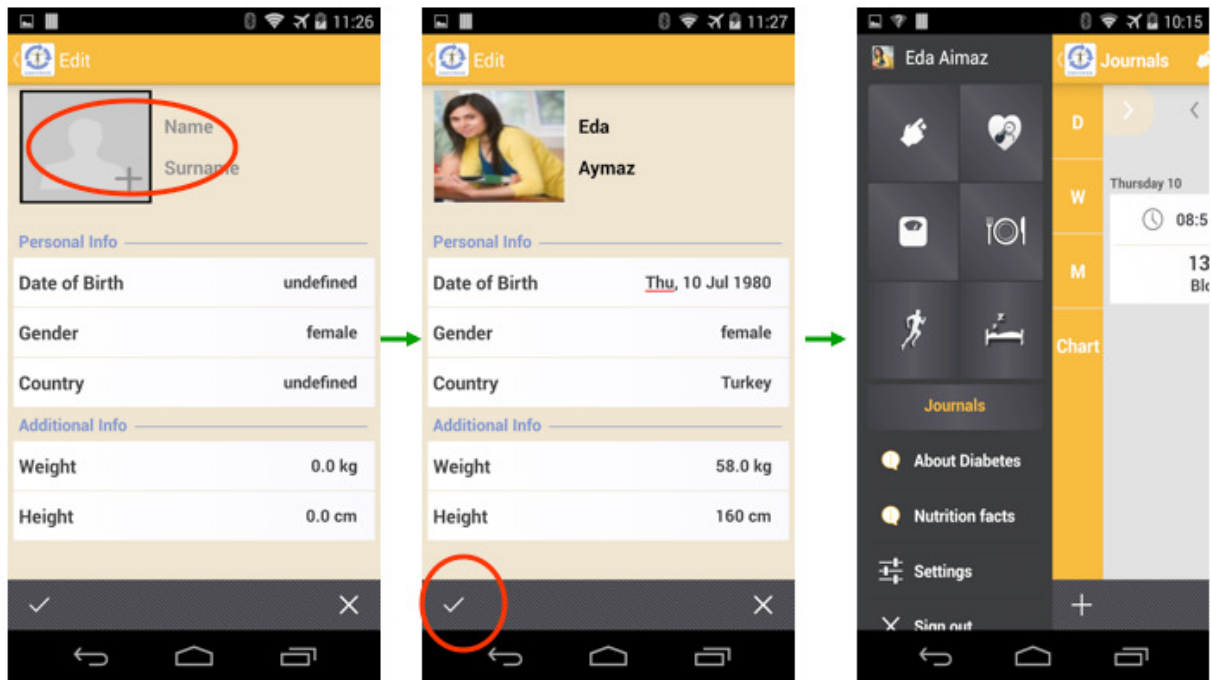


For the first usage of the Mobile Application it is recommended to specify the personal profile for this application.

4.11.3 Profile

By pressing My Profile icon, you are directed to the page with your profile details. There, you can edit these details by pressing the Pen icon. It is important to fill in the Height value, in order to enable calculation of the Body Mass Index (BMI), in the context of the Weight ODL.



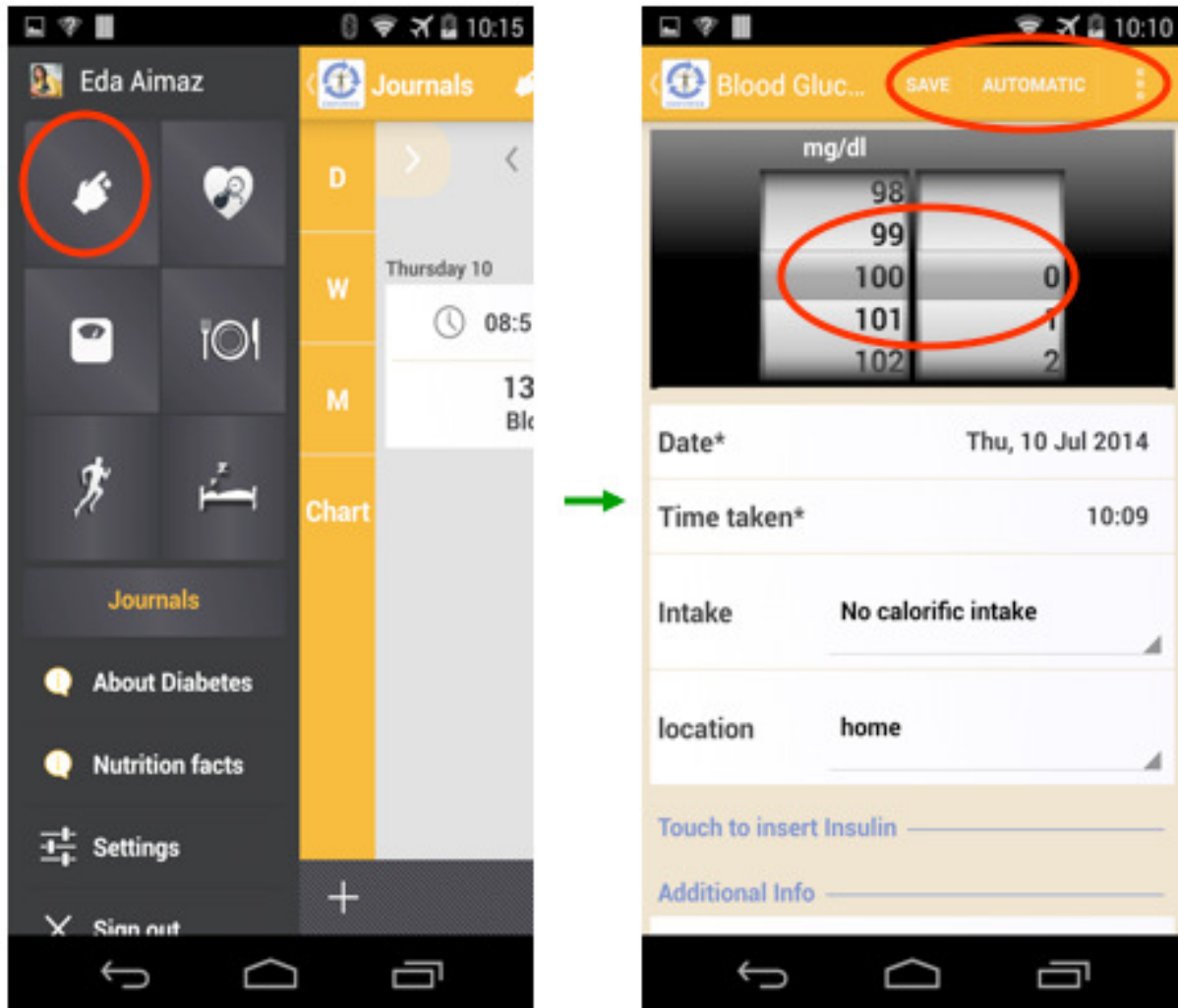


4.11.4 Collecting Data

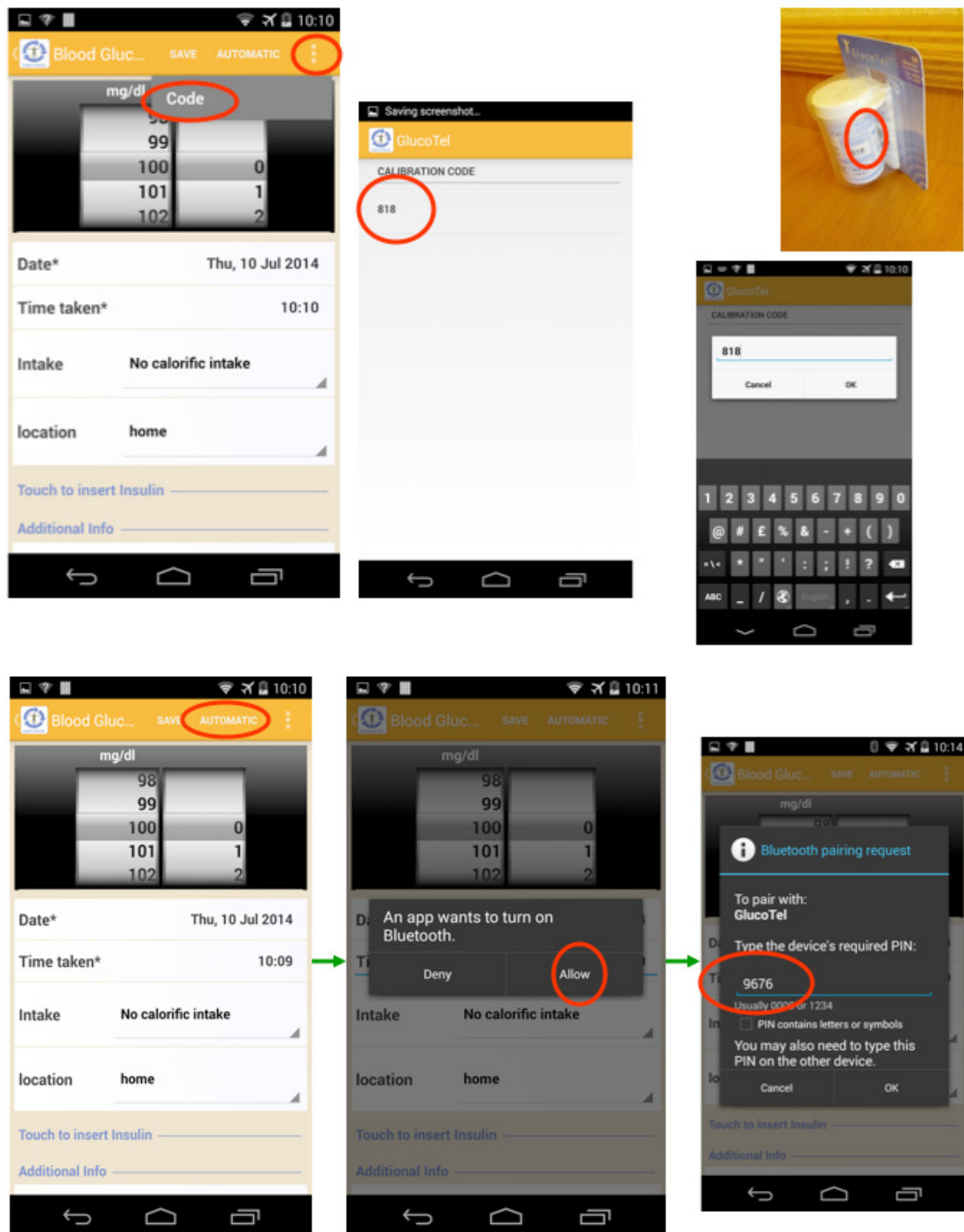
The Mobile Application serves primarily for the recording of journal entries, the so-called “Observations of Daily Living”. The remainder of this section shows the distinct variations of ODL recordings.

4.11.4.1 Glucose

You enter your blood glucose reading using a submit form. Also, you are allowed to enter the insulin intake and additional information such as mood level, stress level and comment, exploiting user-friendly widgets (rating bars and smileys).

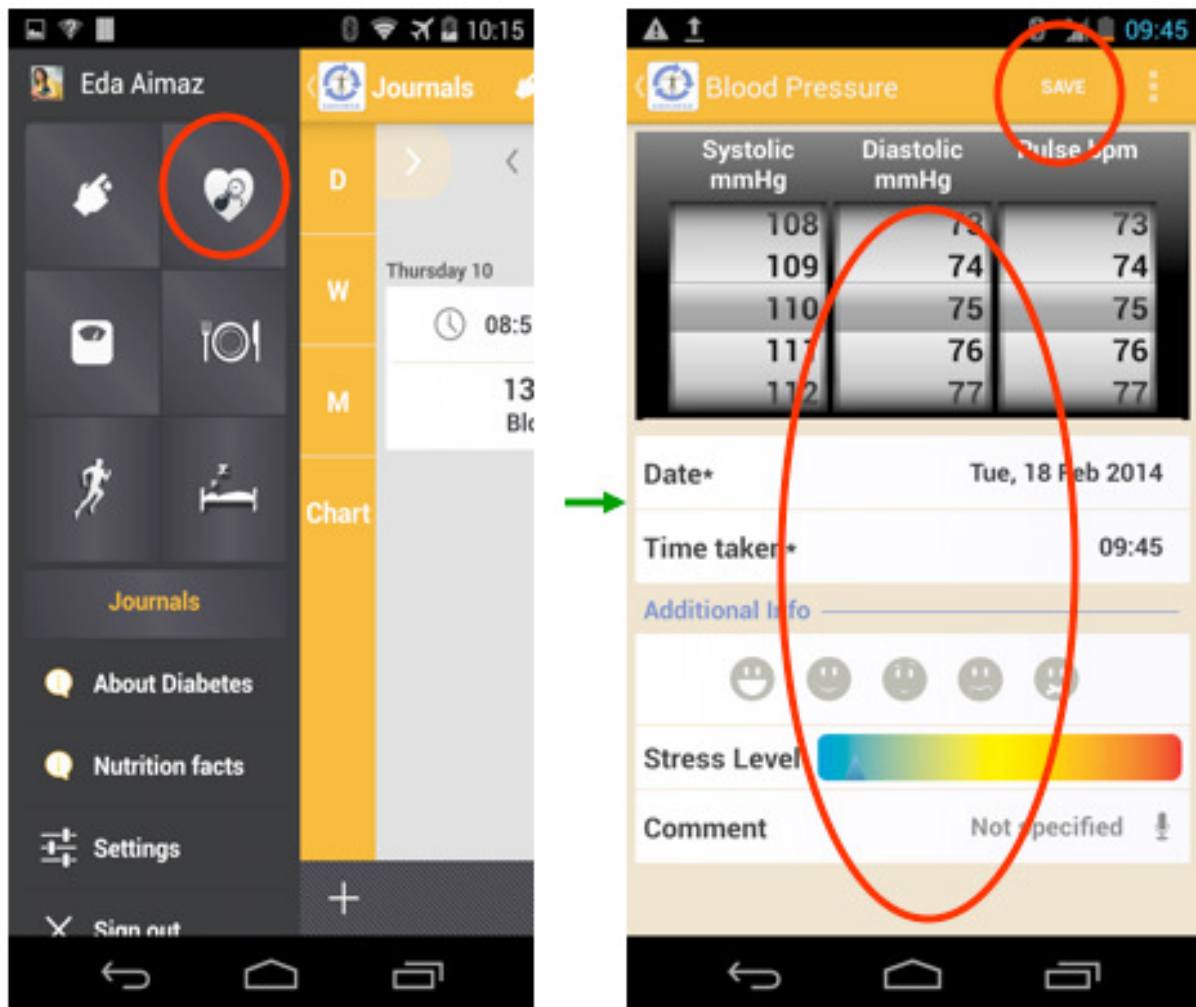


By pressing the "AUTOMATIC" button you enable the automatic preference and thus you are able to take your measurement using the Glucotel medical device. The user takes the measurement and automatically the reading is displayed on the same screen as in manual entry case. Just before the first use of the Glucotel, you should register in the mobile app the calibration code displayed on the strips package. In order to automatically retrieve the measurement from the glucose measuring device to the mobile app, you should allow the mobile app to open the Bluetooth communication, whenever such a prompt window appears. During this process the pairing key should be provided (typically this is 9676, but you should check the Glucotel documentation).



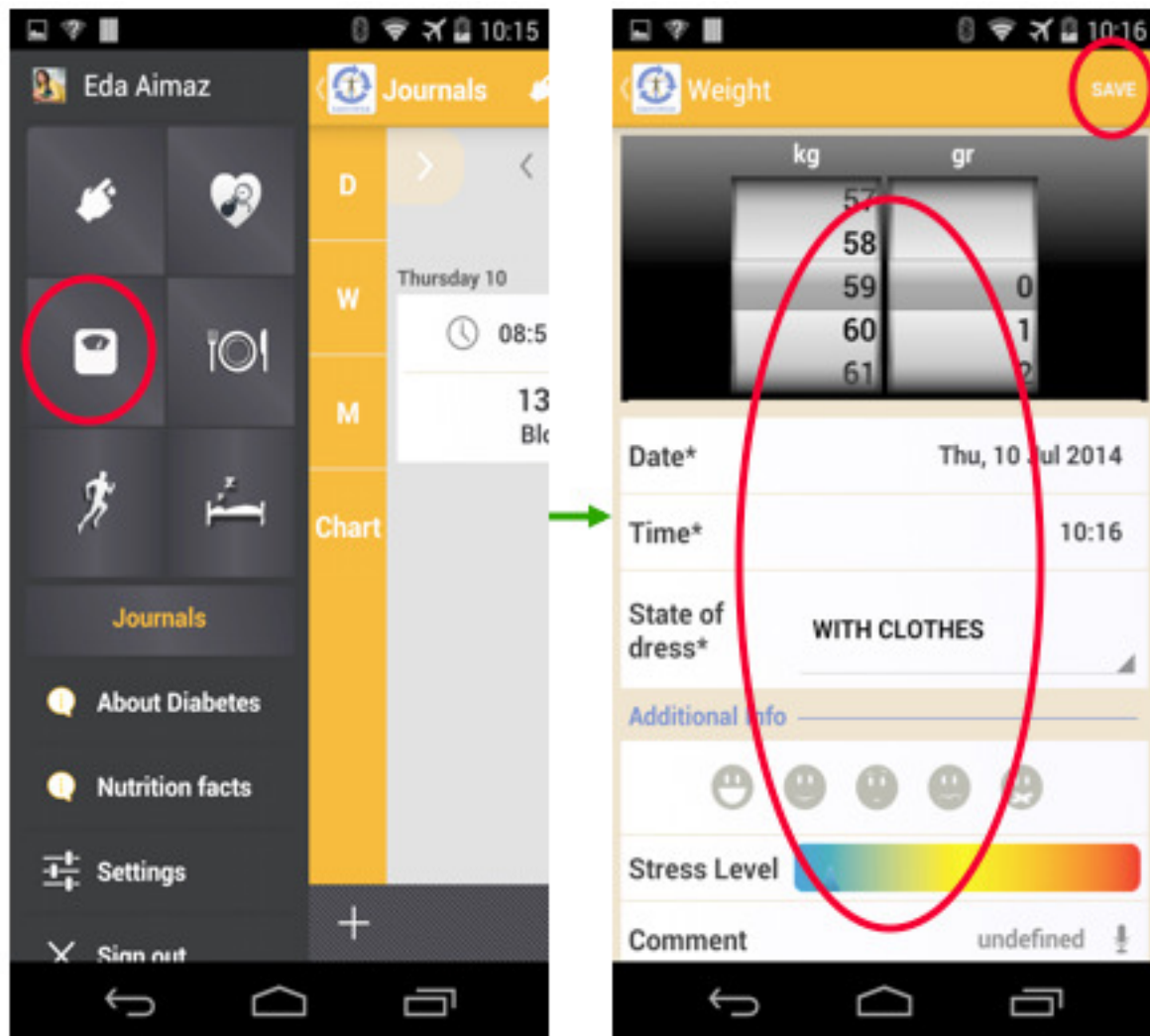
4.11.4.2 Blood Pressure

The user is able to record her blood pressure values, by visiting the corresponding page, clicking the proper icon of the main menu. The user fills in the Systolic, Diastolic and Heart Rate (Pulse) values, and optionally the mood and stress level, and presses the Save button.



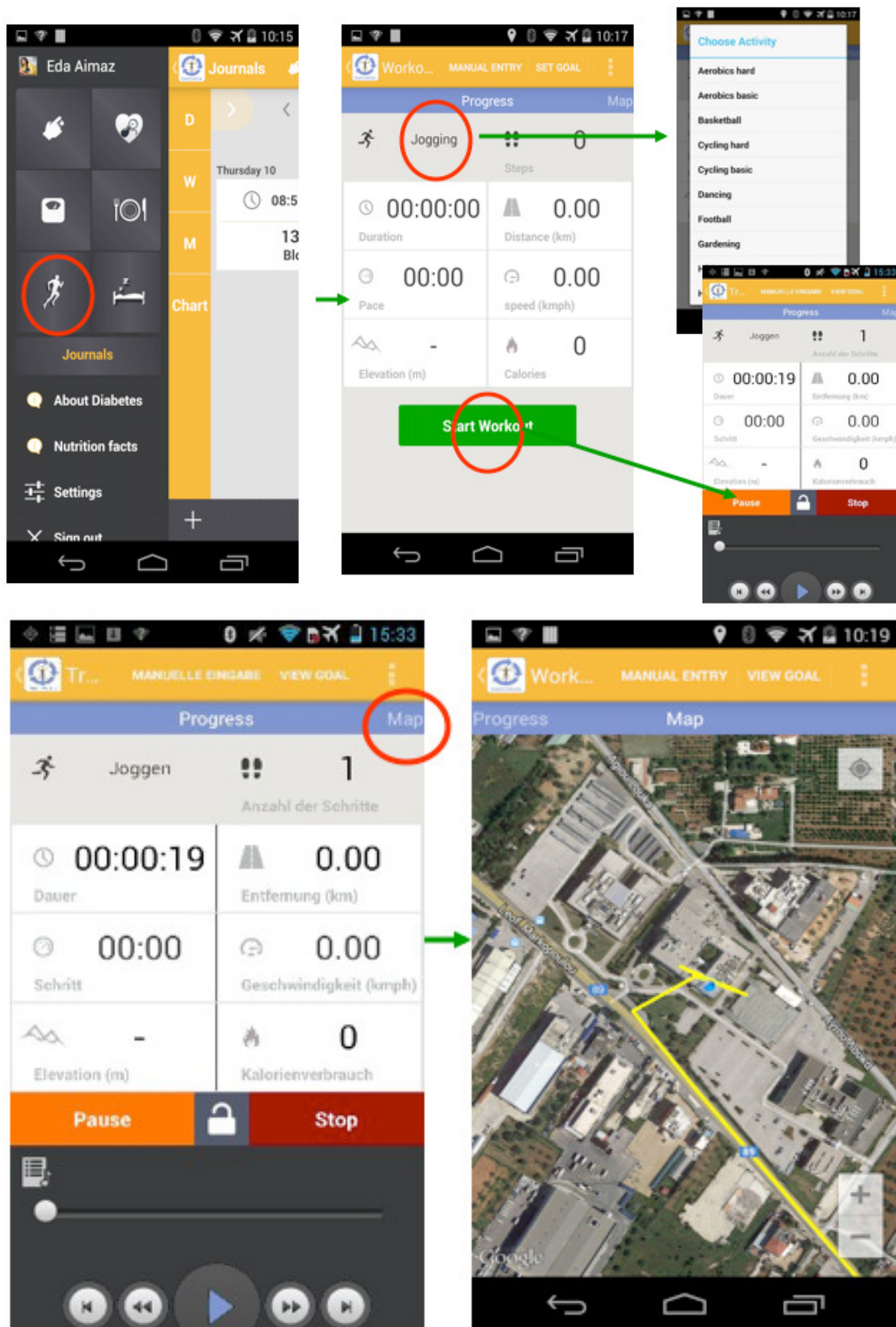
4.11.4.3 Weight

You can record your body weight values, by visiting the corresponding page, clicking the proper icon of the main menu. You fill in the Weight value, and optionally the mood and stress level, and presses the Save button.



4.11.4.4 Physical Activity

Using the workout tracker, you can record duration, distance, pace, speed, elevation and calories of her activity. Also you can monitor your route on the map and store your route to follow it next time. This scenario is feasible only by enabling GPS for outdoor activities. Also, you can set a workout goal and get informed about your progress by the voice coach enabled during her session.



You can record manually your workout, by pressing the Manual Entry button at the main page of the Physical Activity ODL. After doing so, you are prompted to enter the workout information, and additional information i.e. stress, mood, comment etc.

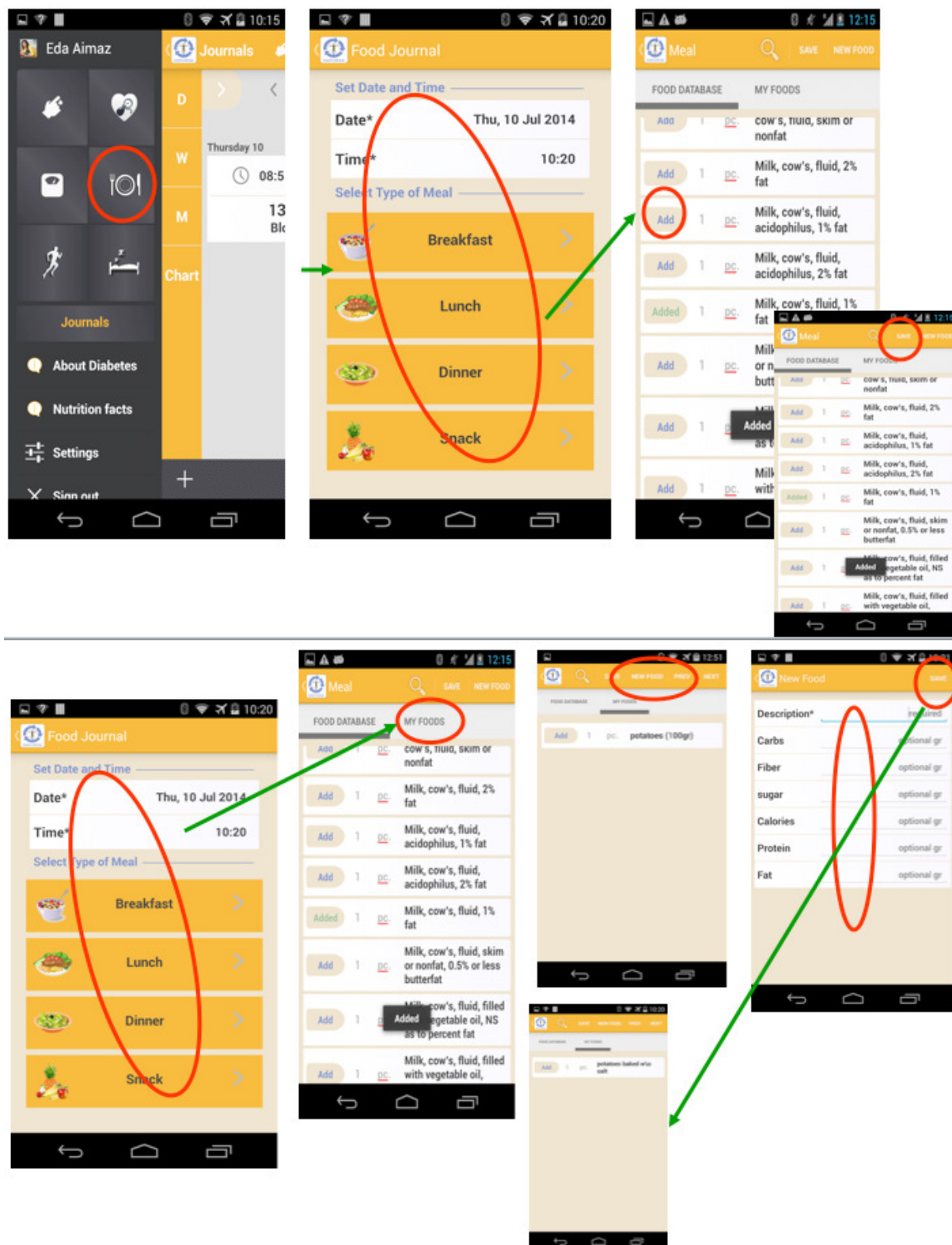
The screenshot displays the 'New Workout' form in the EMPOWER app. The form is divided into two main sections: 'Workout Info' and 'Additional Info'. The 'Workout Info' section contains fields for Activity*, Date*, Time taken*, Duration, Distance, Steps, and Calories. The 'Additional Info' section contains fields for location and Intensity. A 'Choose Activity' modal is open, showing a list of activities: Aerobics, Basketball, Cycling, Dancing, Football, Gardening, Hiking, Ironing, Jogging, Mopping, and Mountain Biking.

Workout Info	
Activity*	Aerobics
Date*	Tue, 10 Dec 2013
Time taken*	10:51
Duration	00:00:00
Distance	5.0 km
Steps	161
Calories	149
location	park
Intensity	light

Choose Activity
Aerobics
Basketball
Cycling
Dancing
Football
Gardening
Hiking
Ironing
Jogging
Mopping
Mountain Biking

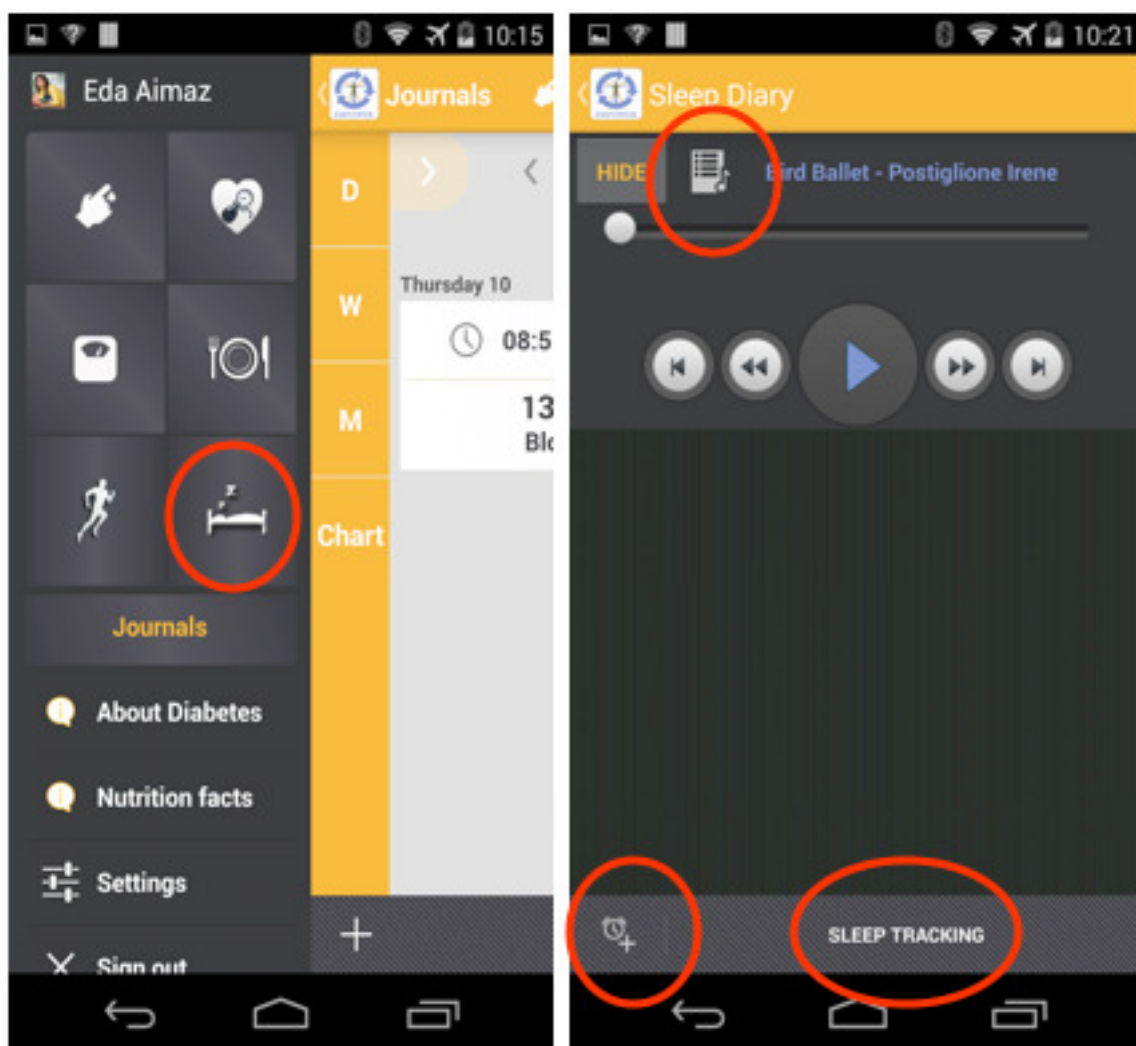
4.11.4.5 Meals

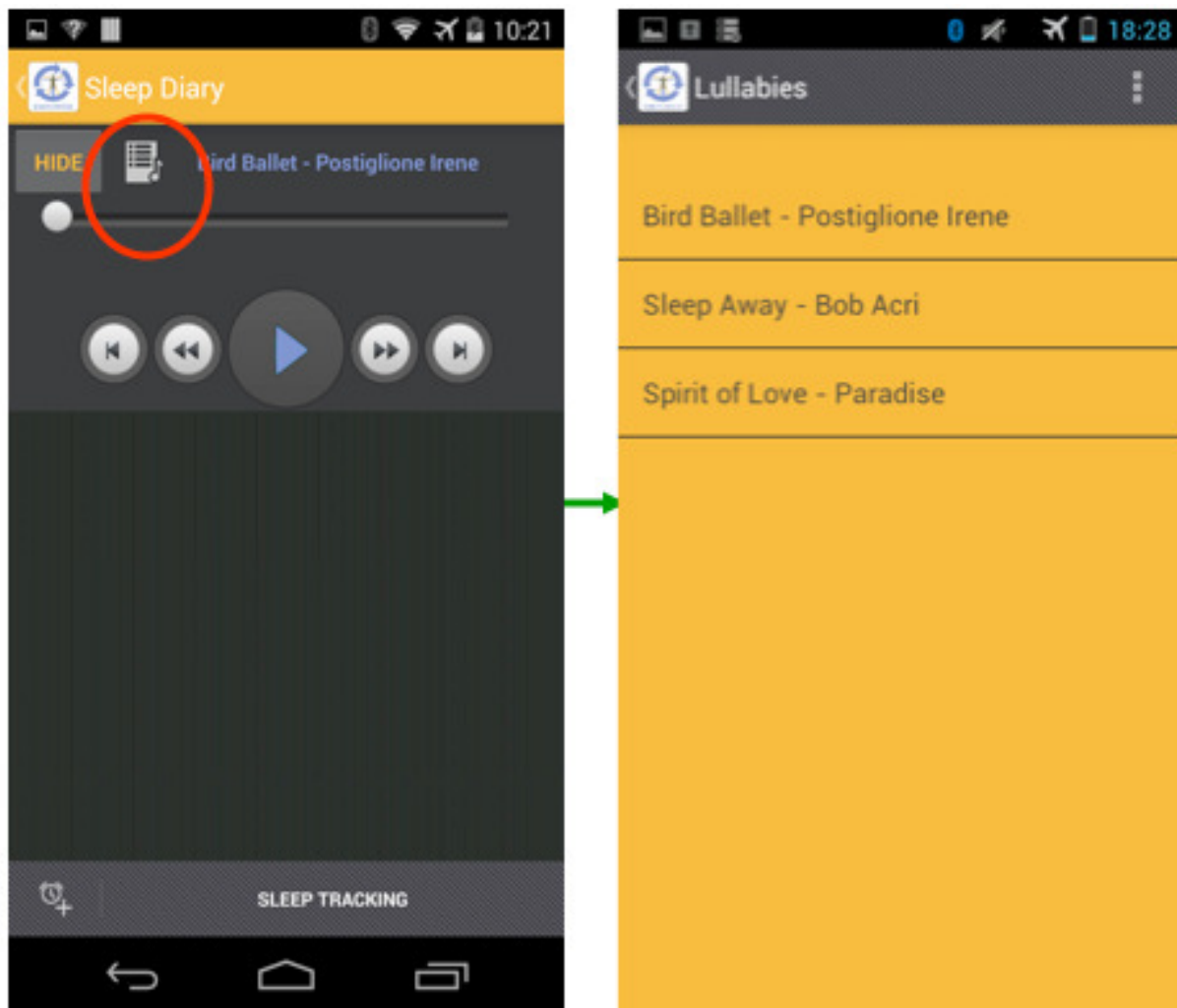
You can record your nutrition details, by visiting the corresponding page, clicking the proper icon of the main menu. You select the type of meal (breakfast, lunch, dinner, snack) and then you either select items from the embedded food database or insert from your personal list of food items. Additional information can also be registered, as with the other ODLs. Also the details of the food items in the personal list can be updated by pressing continuously the food item line. A pop up window appear where the food details can be edited.



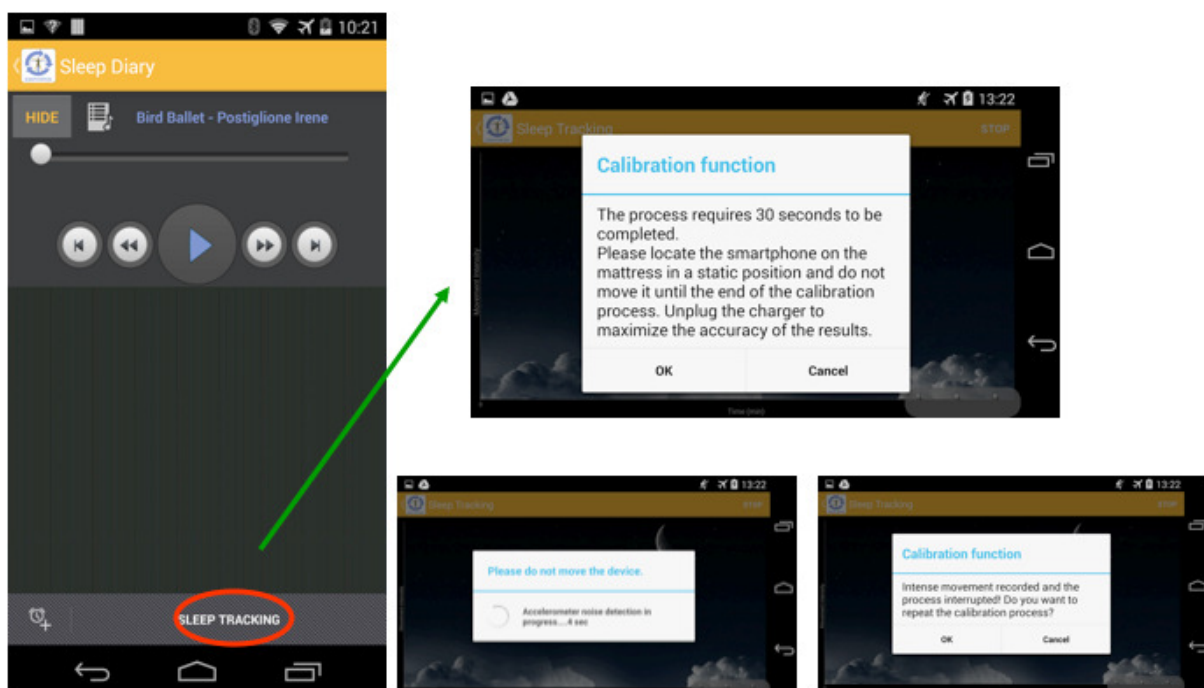
4.11.4.6 Sleep

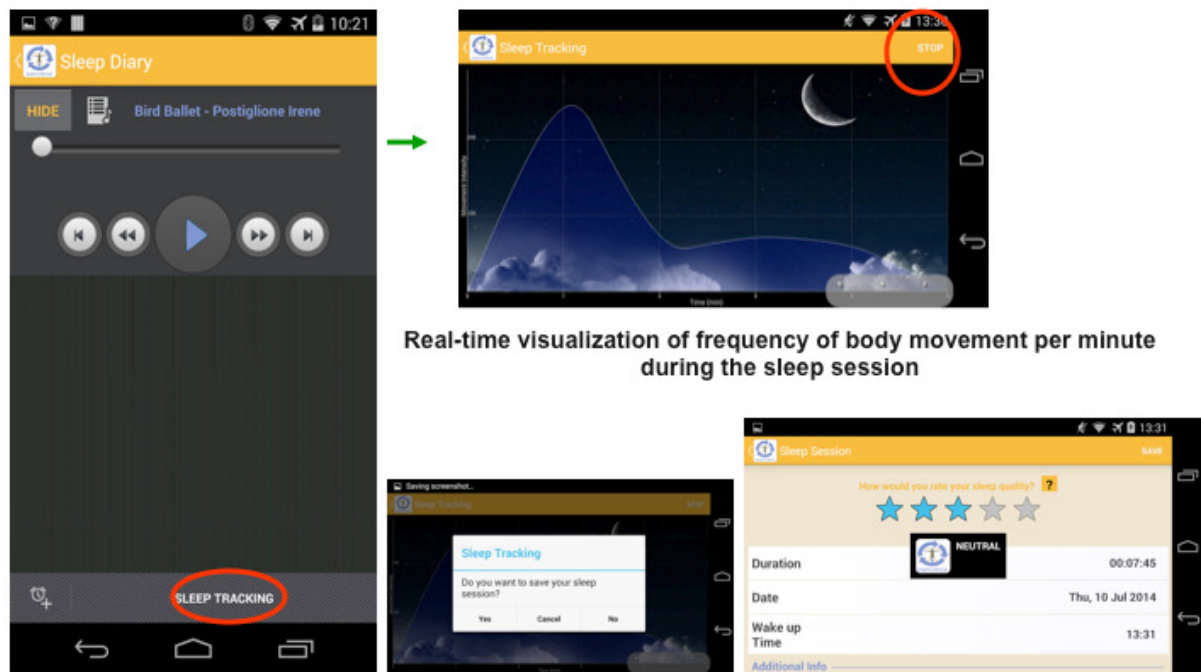
EMPOWER mobile app provides functionality on recording the quality of sleep. Firstly, you can create sleep alarms and schedules your sleep during the week. You enter wake up time for specific days of the week or dates. Also you can modify the sleep alarm whenever you want to. You have the option to listen to lullabies in order to relax and fall asleep. There is a music player user interface that allows you to control the built in media player. The playing list includes all the media items (e.g. mp3) that are available in the device.



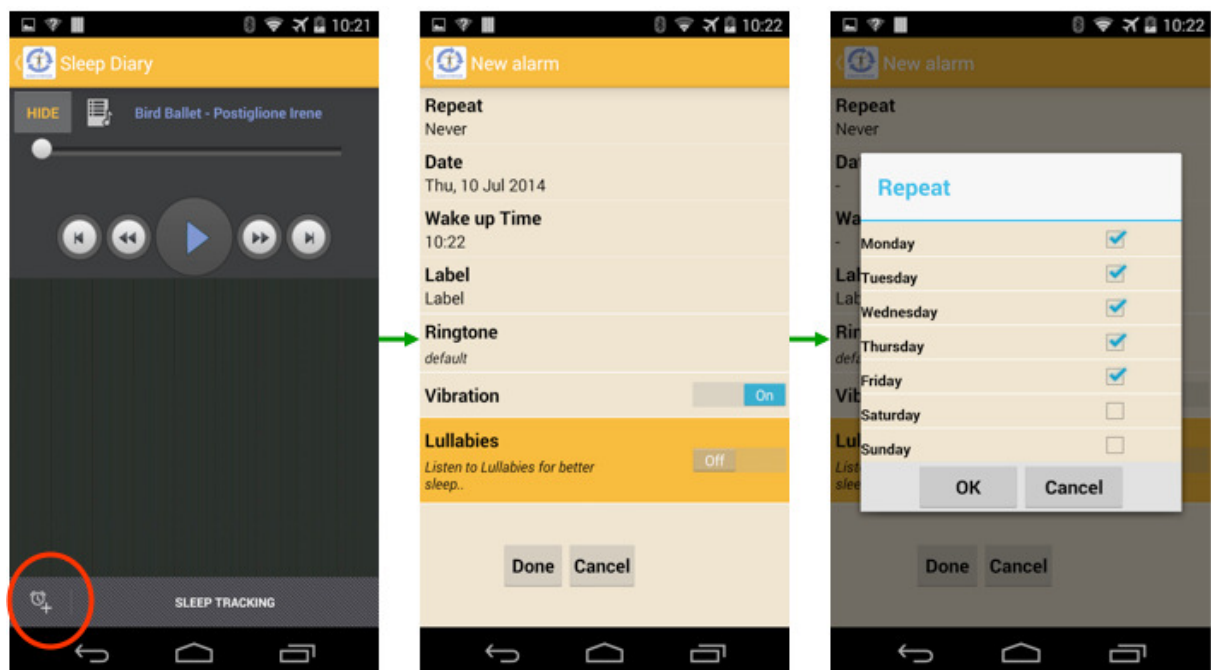


Also, you can record your movement during your sleep by choosing the sleep-tracking button. A graph visualizes your body movement during the sleep session.

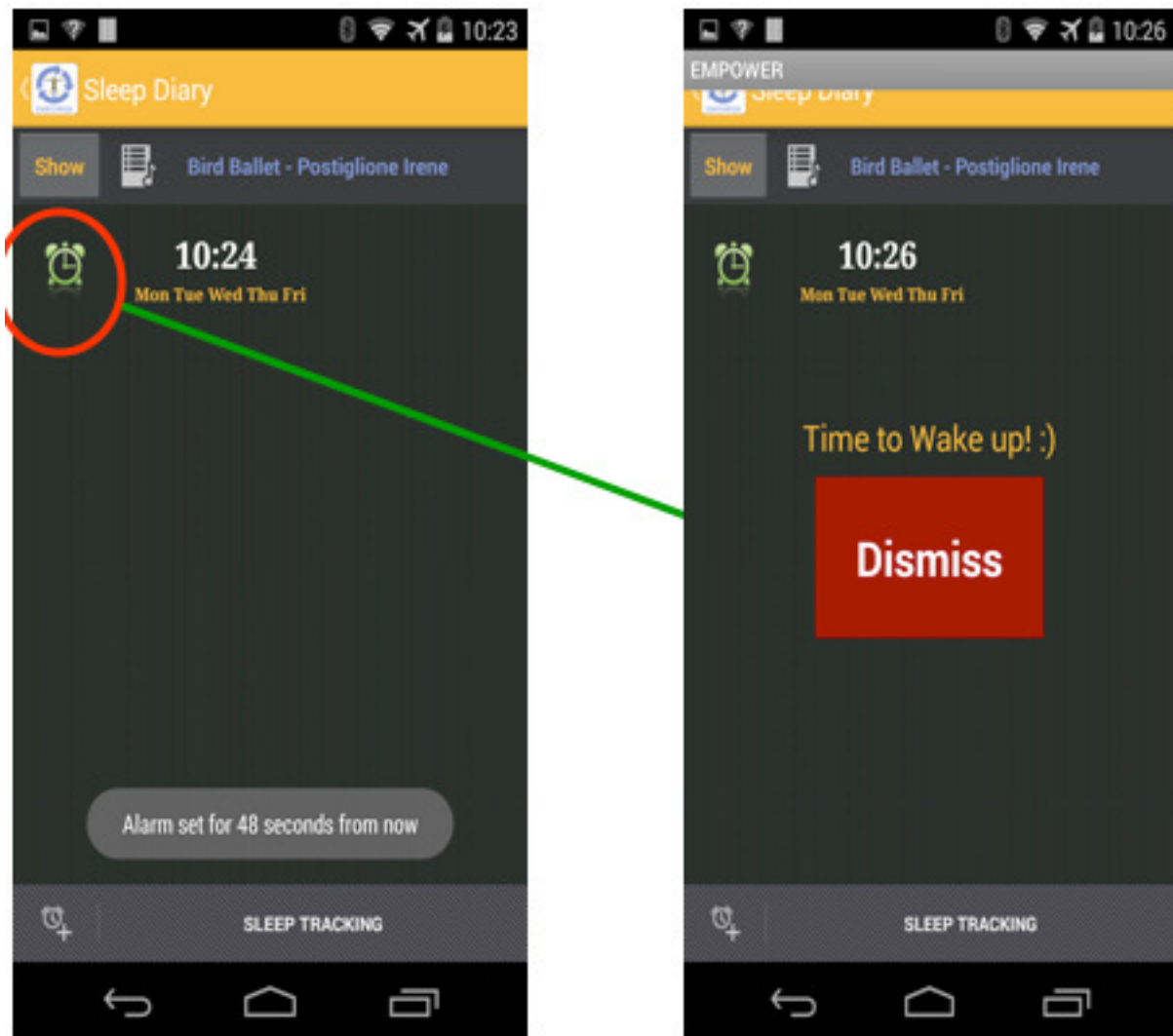




You can also schedule an alarm, as indicated in the figures below.

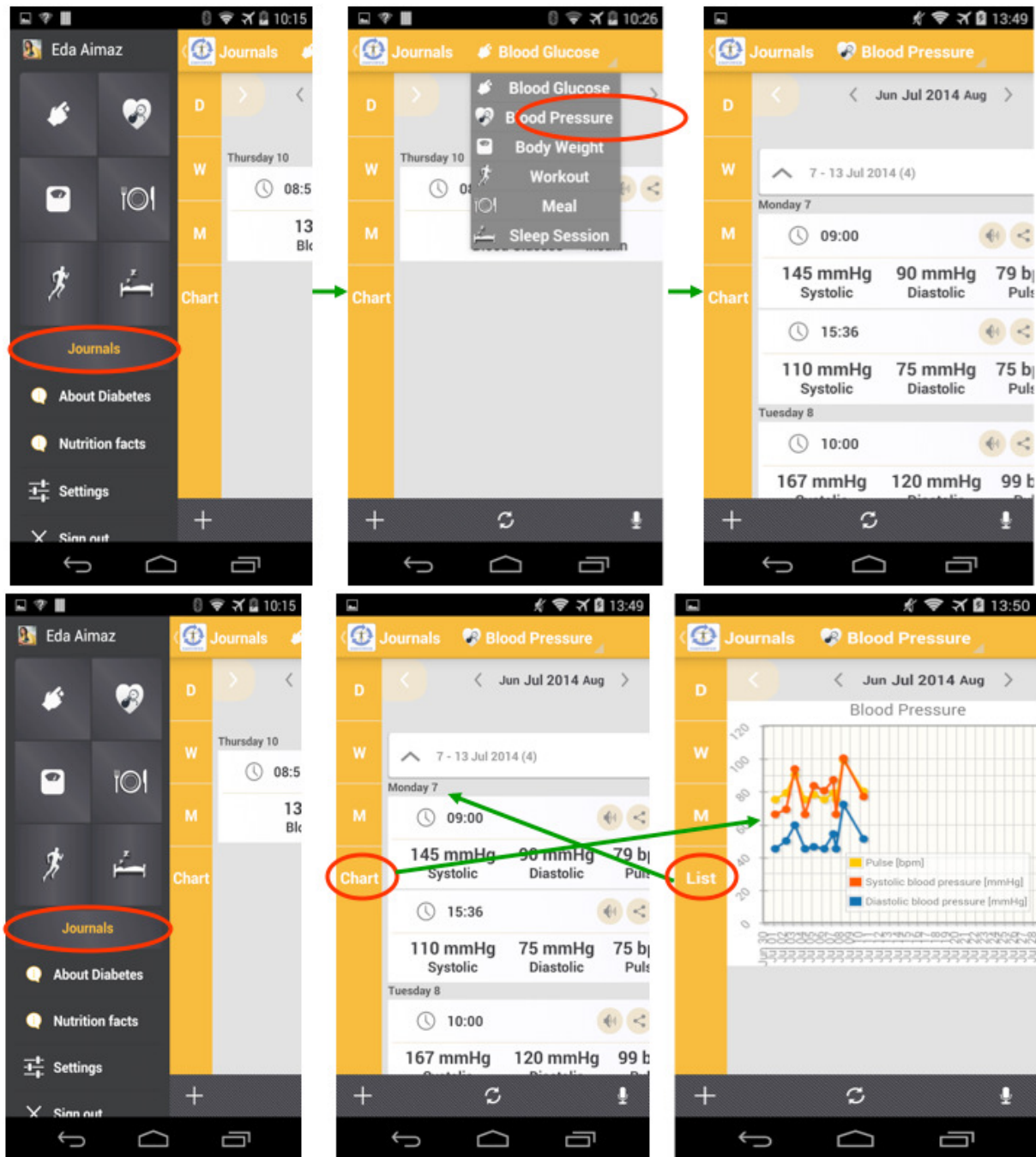


The EMPOWER mobile app displays an alert notification at the defined wake up time.



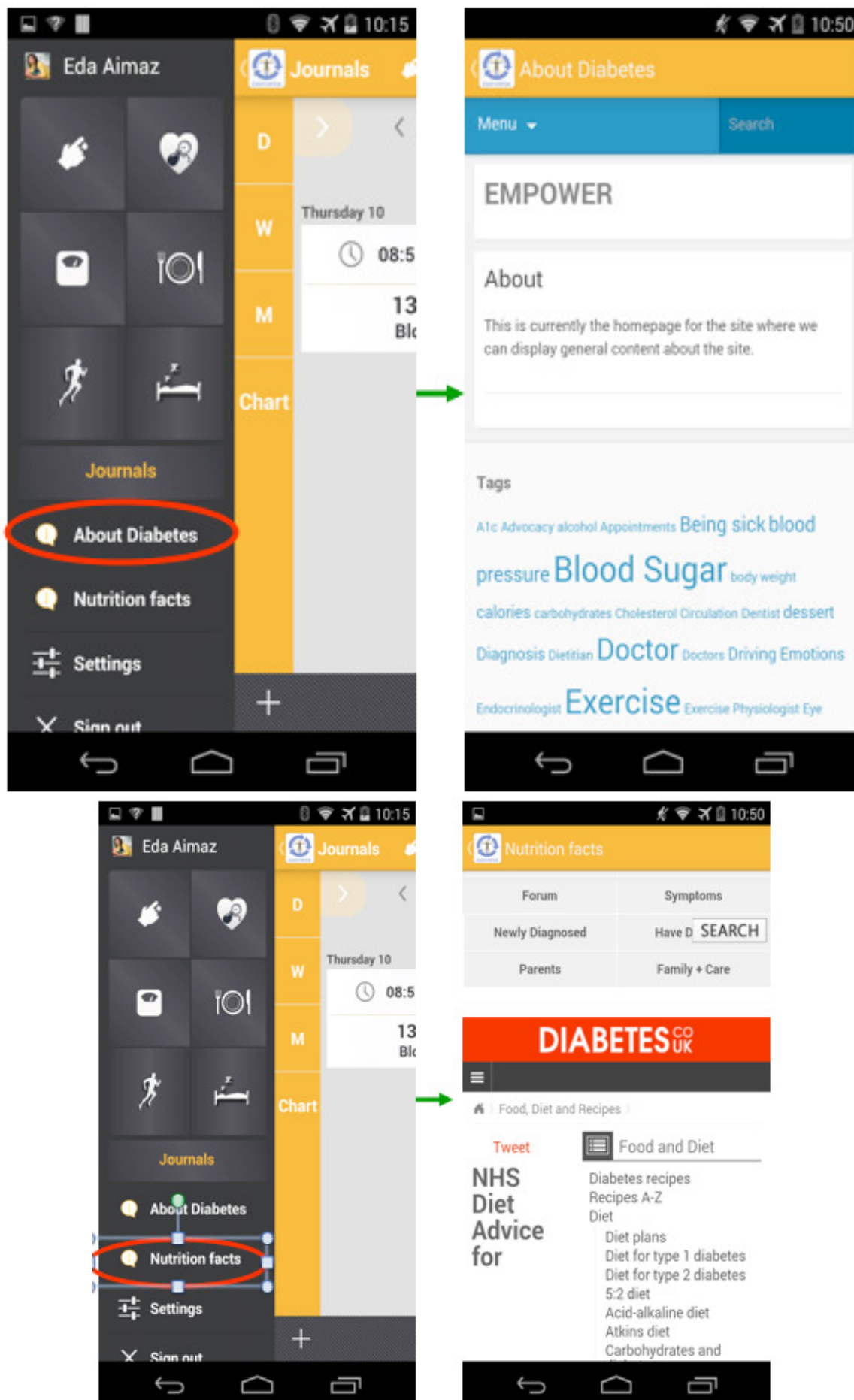
4.11.5 Journals Pages

By pressing the Journals button, you have access to the overview of the recorded ODL values, in list and charts mode.



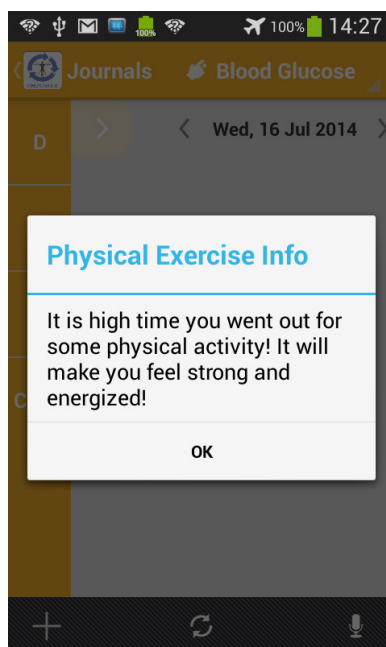
4.11.6 Information Material

You have access to informational material about diabetes through the EMPOWER portal (by pressing the About Diabetes button) or through a Nutrition Facts link. This link directs you in a pilot site-specific web page (different in Germany, in Turkey, and for the demo version of the application).

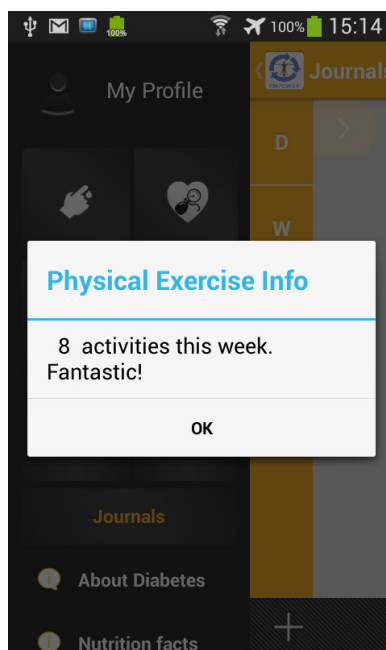


4.11.7 Motivational messages

Upon successful login the application checks the last time the user went out for physical activity. In case you didn't have any physical activity during a week-period, the application pops up a motivational message, as indicated in the screenshot below.

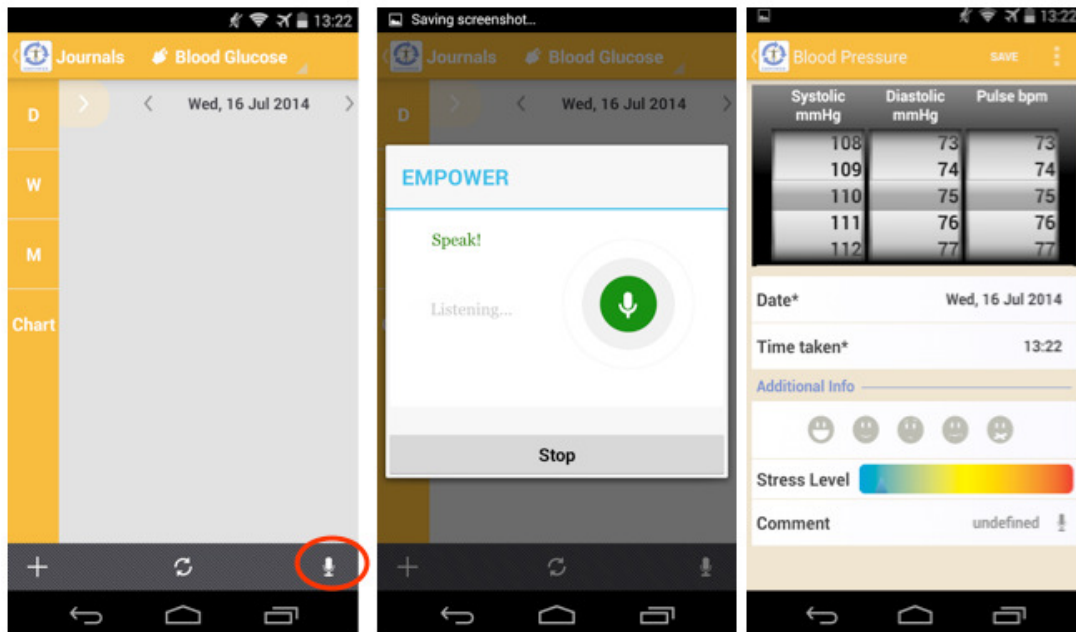


Additionally, the application upon login every Sunday checks the physical activity of the user during the last week and pop ups motivational messages, related to the number of registered physical activities of the subject during the past week, as indicated in the following screenshot.

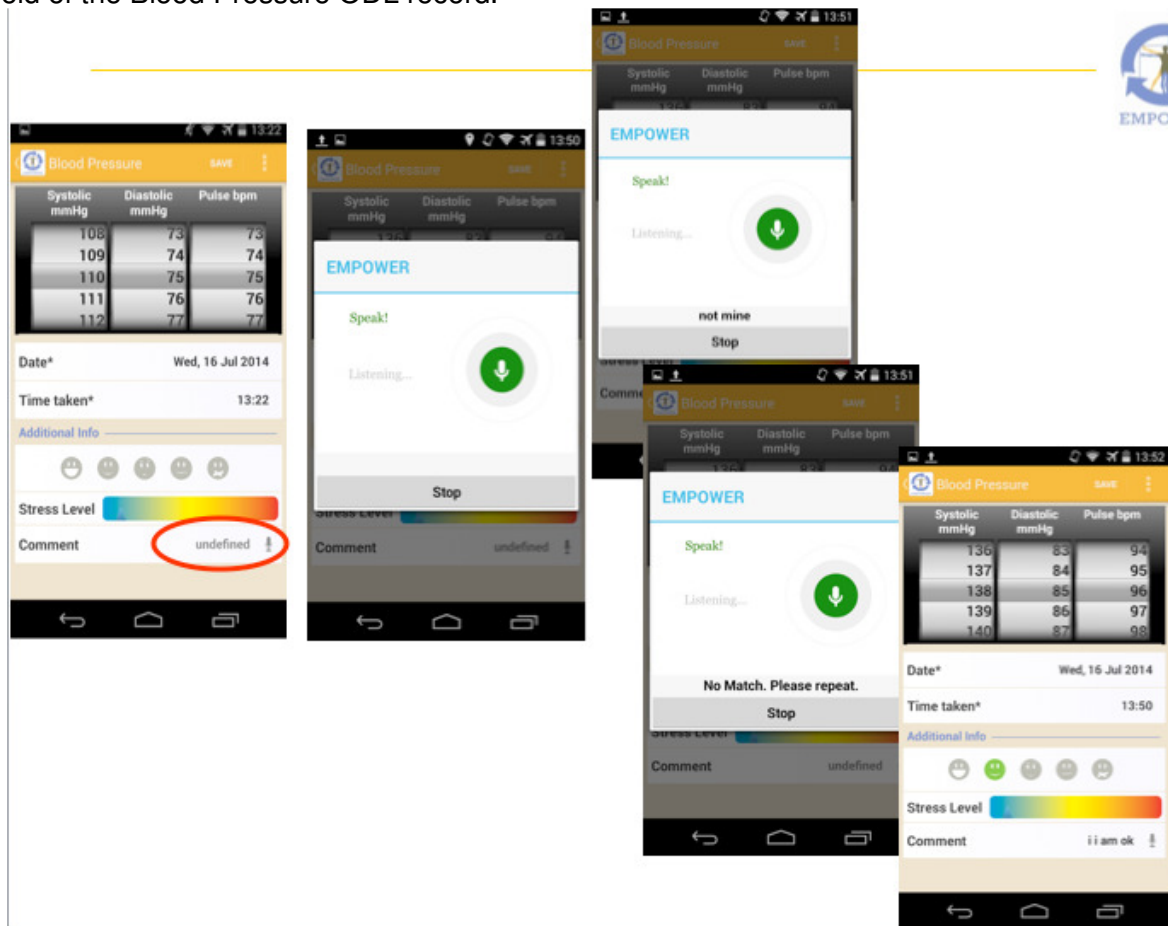


4.11.8 Voice Commands

You can navigate in several pages of the mobile app, by providing voice commands. For example, while being in the Journals page after pressing the microphone icon, if you dictate "Blood Pressure" the application will load the Blood Pressure ODL page (see figure below).



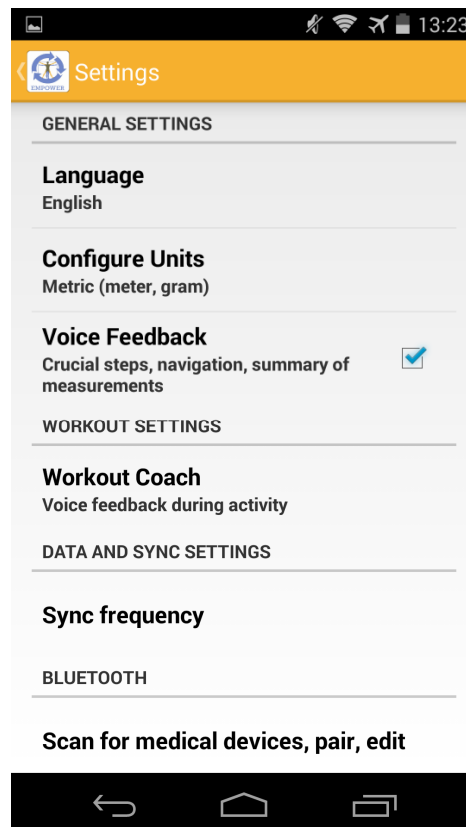
While inserting a new ODL (e.g. a Blood Pressure ODL) you can dictate a comment related to the ODL. As indicated in the following figure, the application can either perceive it wrongly, or not find a match, or perceive it correctly and therefore store it in the corresponding data field of the Blood Pressure ODL record.



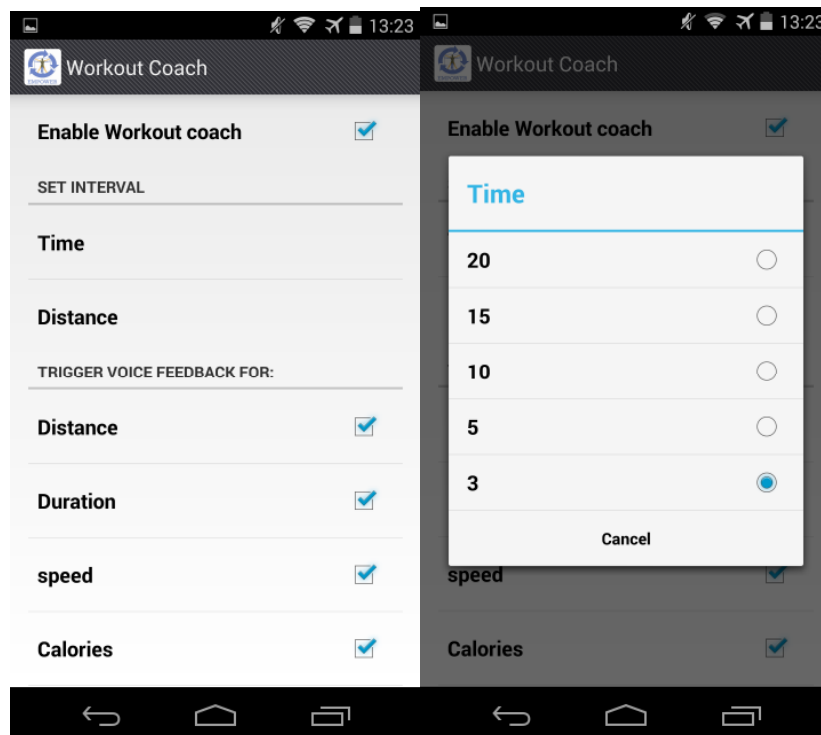
4.11.9 Voice Feedback

Due to the nature of this modality, it is not easy to document its operation via screenshots you will be asked to follow the process below to activate voice feedback and realize how it works by experimenting with the application.

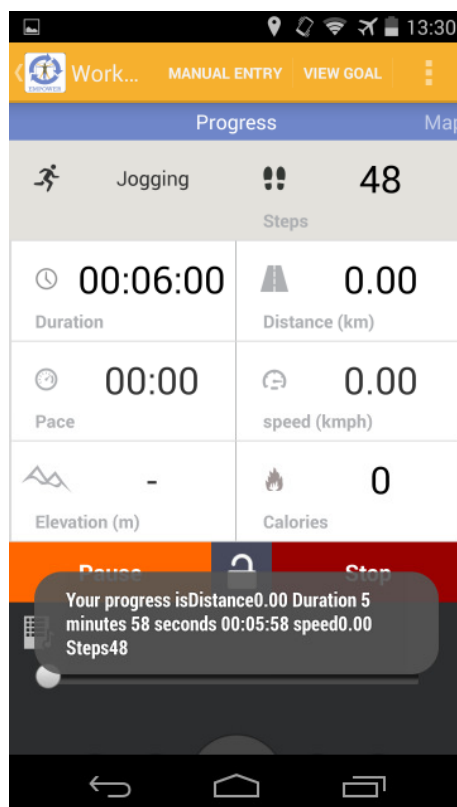
1. Activate voice feedback



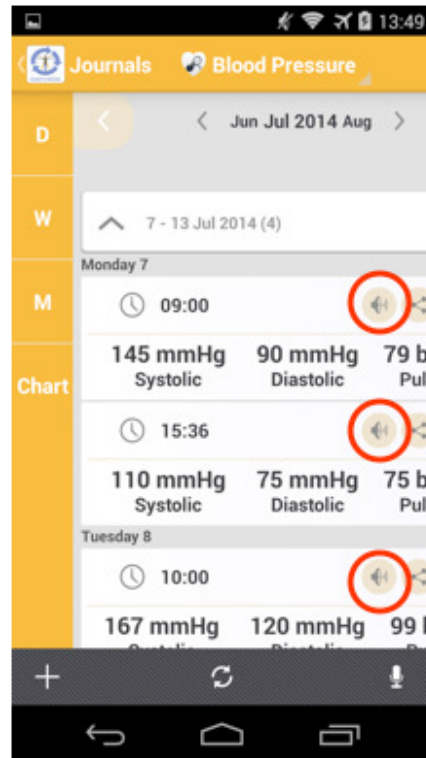
2. Edit the voice feedback parameters during a Physical Activity monitoring session. In particular you can define the time / covered distance intervals for getting voice and written feedback by the workout coach.



The above-mentioned feedback is dictated by a digital coach and presented in the screen of the smartphone.



2. Press the Speaker icon in Journals page of an ODL.



4.11.10 Settings

Using the setting screens you can set your preferences on voice feedback, unit system, language, data synchronization interval, workout voice coach setting, scan and pair with medical Bluetooth devices. All these preferences can be accessed via the related ODL screens.

